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Preface

Just two years ago, at the Industry Advisory Council's (IAC's) Executive Leadership Conference in October 1997, IAC and the Federal Chief Information Officers' (CIOs') Council released a joint study project: "Best IT Practices in the Federal Government." The study compiled and documented 20 representative case studies that demonstrated the successful application of information technology (IT) in Federal departments and agencies. The cases came from 19 departments and agencies; only Veterans Affairs had two cases selected. They covered both administrative (payroll/personnel, logistics, communications) and programmatic (weather observations, asbestos standards, etc.) areas. They came in all sizes, from less than $1 million to almost $150 million. The affected user population or serviced public ranged from the entire population of the nation to fewer than 5,000 individuals. Some took only a few months to complete; one took more than a decade.

Unfortunately, only one came from the entity that spends a significant portion of the Federal Government's IT budget—the Department of Defense. To remedy that oversight, we decided to focus this second volume on only a sector of the Federal establishment—national security, international affairs, and emergency preparedness.

The Case Approach

The approach was almost identical to the initial study. IAC created a Task Force comprising volunteer IT professionals drawn from member companies. Working under the guidance of the Outreach Committee, the Task Force was assigned the task of compiling and documenting representative case studies that demonstrated the successful application of IT in Federal departments and agencies. Task force members were again instructed in the case method, and internal protocols were established to ensure comparability in the studies.

Entry conferences were scheduled with the CIOs or the Deputy CIOs of the targeted agencies.

After those initial sessions, the IAC Team assessed 45 nominated programs from 15 agencies. Thereafter, interview teams worked directly with Federal points of contact on the special projects to develop and refine relevant data on the nominated cases.

The Task force, with the guidance of the Outreach Committee, then culled the nominated cases to reach a manageable—but representative—sample of case studies that demonstrated where the application of IT had made a positive difference in Federal departments or agencies. These examples had to be of significant size, materially impact the Governmental unit's mission, and be considered a success. Success was defined by the Task Force and the Council as:

♦ IT used to:

  – Solve problems
  – Increase productivity or save resources
  – Improve quality, timeliness, or accuracy
  – Improve customer satisfaction

♦ Delivered on time and within budget

♦ Demonstrated a positive return on investment of IT expenditures.

Two final criteria were added during this second study. First of all, we opted to focus on recent examples of IT successes—those that had been implemented or deployed in the last year or two. The unfortunate consequence was that excellent projects and case studies from 4 to 5 years ago had to be omitted—projects such as the Defense Finance and Accounting Service's Electronic Commerce Office system, the Department of the Air Force's Joint Expeditionary Force Experiment and the Office of the Undersecretary of Defense for Policy's Cable Handling and Information Retrieval System.

Second, as a policy decision, we opted to exclude Year 2000 (Y2K) remediation efforts. But as the Nation—and the Federal Government—moves toward the most unforgiving of systems due dates, it is clear that we owe a debt of gratitude to people

such as recently retired Kathy Adams of the Social Security Administration, who sounded the alarm early, and to Fernando Burbano, the dynamic CIO at the Department of State, who led a dramatic turnaround in Y2K readiness at our international affairs agency.

On August 13, 1999, a "red team" made up of senior IT managers from the Departments of Commerce, Defense, and the Army, the General Services Administration, the Environmental Protection Agency, and the General Accounting Office met in a day-long session to review 27 projects presented by the Best Practices Task Force. We were assisted this year by Dr. Bruce Rocheleau, a professor of public administration at Northern Illinois University and author of "Prescriptions for Public Sector Information Management: A Review, Analysis, and Critique," forthcoming in the *Public Administration Review*. From these presentations, the Outreach Committee selected 14 case studies for inclusion in this volume.

As was the case previously, we are not so presumptuous as to claim that these projects are the "best" IT projects in these sectors of the Federal Government. But they are excellent examples of where and how IT has been applied successfully and in a cost-effective manner to help achieve a department's or agency's goals and objectives. In addition, all the cases nominated provide valuable insights into how to successfully implement Governmental information systems. Again, the cases are as diverse as Volume I; they cover document management, executive information systems, project tracking, knowledge management, and systems consolidations. They cover logistics, career development, finance and accounting, acquisition, security classification, disaster recovery planning, and strategic planning. Coverage, costs, and implementation times again varied; but the theme was a common one: IT being applied successfully and contributing immeasurably to mission accomplishment.

Why "Success Stories"

Regrettably, there are still too many stories of IT programs that suffer multi-million dollar overruns, schedule slips measured in years, and dismal mission-related results. These 14 case studies are not intended to be public relations articles. They are, however, based on the premise that we need to examine successes as well as failures. As we said once before, we seem to excel at assembling autopsies. We have too few studies of healthy programs and successful systems implementations. This volume, combined with our earlier study, begins to build a body of work desperately needed in the IT literature.

Final Thoughts

The Task Force developed a number of salient observations in the course of this study; they are presented in the body of this report. Let us note just a couple of key aspects of effective IT management:

♦ **Continuous High-Level Leadership Support in All Phases**—The successful IT project enjoys continuous, high-level support. The majority of all types of success stories involve either an agency head or a CIO or equivalent as both *initiator* and *decisionmaker*. In addition, the extent to which the same senior manager is involved in all phases of the project significantly increases the prospect for success, particularly those involving multi-year systems development activities. While strong senior management support as a key ingredient to successful management change is almost a truism, such support must be not only strong but continuous. There must be commitment and follow-through—not only in the early stages, but throughout implementation.

♦ **Service Orientation**—The majority of success stories are highly client/service oriented. This manifests itself in negotiated service standards, frequent client contacts and a general management commitment to find ways to make IT work for the client. The service orientation is also manifest in continuously accommodating the provision of IT to changes in the agency's mission and program priorities.

♦ **People Orientation**—The most successful projects demonstrate concern for and involvement of the employees affected. People are key. Much of the success is due to the creativity, imagination, dedication, and hard work of Federal employees. On the other side, technology brings about changes, sometimes

rapid and dramatic changes. Change management and retraining ought to be seen as integral to information systems implementation.

♦ **Bias for Action**—Successful organizations focus their attention on actually getting things done. In their best seller, *In Search of Excellence*, Thomas J. Peters and Robert H. Waterman termed this the "do it, try it, fix it" approach to life, as opposed to the "paralysis-by-analysis" syndrome. Many of the case studies revealed that once an idea occurred, the department or agency moved quickly to implement the change. Occasionally this involved the establishment of a pilot or an experiment to which clients and/or services could then be added in phases. As one department official described his efforts, "We wanted to establish a beachhead and then expand from there. If we moved too slowly, our line units would have stonewalled us to death."

♦ **Change Agents**—Peters and Waterman cited Texas Instruments, IBM, and 3-M as firms that revealed the importance of what they termed "product champions." These are the people who believe in an idea and are willing to do whatever it takes to make the idea work. As Rosabeth Moss Kanter demonstrated in *The Change Masters*, when environments and structures are hospitable to innovation, people's natural inventiveness and power skills can make almost anything happen.

Our case studies also suggested the notion of "change agents"—one or two key people involved throughout a project who had the idea, helped sell it, gathered support for the proposal, and often were charged with putting it in place. These "agents" were both politicos and careerist—Deputy CIO Marv Langston, General John Sheehan, Vice Admiral Hal Gehman, Lt. Col. Michael Dorohovich—who popped up and took the risks needed to try something new.

♦ **Reengineering**—It is important to ask, and answer, all three of the "pesky questions" including "Have we reengineered the processes to which technology is being applied?" For example, if 16 reviews and signatures are required to approve a contract, workflow

software can automate that process. But why do we need 16 reviews and signatures? Simplify the process first, then add workflow software.

But while it is essential to reengineer first, we must avoid "paralysis by analysis." We found cases where reengineering studies required 18 to 36 months *before* technology could begin to be applied. And then we found that the technology itself changed the process and hence, the reengineering had to be revisited. Perhaps we need to begin reengineering our reengineering processes to reduce cycle times.

♦ **Return on Investment (ROI)**—The old adage is that you cannot manage what you cannot measure. According to a survey of Fortune 500 companies, ROI is a near-universal metric for measuring IT investments. While there is considerable discussion of ROI, Federal agencies are struggling with how to do it, how to operationalize ROI in their agencies. It is clear we need to provide assistance to agencies to improve ROI analyses at the capital planning and investment analyses stages.

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Alan P. Balutis
Co-Chair, Outreach Committee
Federal Chief Information Officers Council

Executive Summary

It has been almost four years since "the Revolution in Military Affairs"—the phenomenon that resulted from the confluence of several forces at the end of the Cold War which sought to take advantage of the superior technological edge enjoyed by the United States over the rest of the world—entered the lexicon. And it has been three years since the Information Technology Management Reform Act (ITMRA) established the requirement for each agency to have a Chief Information Officer (CIO). In the ensuing few years, the criticality of information technology (IT) in solving problems resulting from a downsized military establishment and a reduction in the availability of resources has been significantly elevated. As resources have been reduced and mission requirements have increased, great strides have been made in the use of IT throughout the Department of Defense (DoD) and other National Security-related agencies. Concomitantly, senior officials, both uniformed and civilian, have become increasingly "IT savvy," which has resulted in an increased requirement for IT in all facets of the National Security establishment. In short, the members of the National Security establishment have seen what IT solutions can do to enhance mission performance and readiness—and they want more of it.

Two years ago, an industry team of volunteers from the Industry Advisory Council (IAC) examined representative examples of successful IT projects in the Federal Government. At that time, investment in IT was regarded by many as a waste of money. This widely held perception presented a significant challenge to the Government's CIOs as they began to assume the responsibilities assigned to them under the ITMRA. Two years later, another IAC volunteer group of IT professionals was asked to select and evaluate representative examples of successful IT programs in a much smaller segment of the Federal Government: the National Security arena. At the completion of this project, the IAC team is once again able to discuss what is currently

"working" in the area of National Security and to offer suggestions on how other Governmental agencies might replicate that success. The result of the study is an outstanding conclusion: the perception of IT as a critical element of success has gained a very strong foothold in only two years!

Initial Observation: the Influence of the CIO in Successful Programs is Significant

Three years after enactment of the ITMRA, the influence of the CIO continues to increase. That factor, coupled with the increasing importance of the Federal CIO Council, has thrust IT into the limelight and ensured more successful IT programs. Significant improvements have occurred in the sharing of information, techniques, and approaches to solutions in these last two years, which is a result of the increased effectiveness of the CIO Council and its members, who now meet, network, and share ideas to a greater degree than ever before. The IAC Team also found that the level of overall collegiality— not only among CIOs, but also among IT professionals throughout the National Security establishment—has increased tremendously since the last study. Barriers to the flow of information are falling; that is key if IT programs are ultimately to be able to function in a downsized and resource-constrained National Security establishment. The programs judged to be successful in this iteration of the project all shared one common trait—they could all point to the influence and the significant, direct involvement of the CIO in the program's success.

The IAC Team assessed 45 nominated programs from 15 agencies, all in some way involved with National Security. At the outset, the Team again adopted the firm rule, which had been established in the 1997 study, of not including any programs that were not fully into the implementation phase and that could not point to some clear return on investment (ROI). To ensure that successful

examples demonstrated the innovative use of the latest technologies and ideas, the decision was made to eliminate programs that had been in existence for more than five years. Also disregarded were programs which offered clear success, but which had not been fully implemented or which had been operating for too short a time. Many of these programs could be considered in future studies.

What Did We Find?

As in the inaugural study completed in October 1997, the Team again found that the programs nominated by the various agencies shared interesting traits and had accomplished a broad spectrum of business purposes through the use of numerous technologies and the execution of innovative ideas. The Task Force also noted a significant increase in the use of Web technologies to address and solve agency problems—a direct reflection of the commercial and civilian worlds, where the Web rules. It is also indicative of the Government's commitment to implementing best commercial practices and using commercial off-the-shelf (COTS) products. Successful IT programs could be best understood if grouped into the following general categories:

♦ Automation of Manual Processes
♦ Best Commercial Practices
♦ Consolidation of Systems or Programs
♦ Defining and Delivering New Services
♦ Document Management
♦ Executive Information Systems
♦ Information Delivery and Sharing
♦ Knowledge Management
♦ Project Tracking
♦ Technology Insertion (COTS usage)
♦ Web Technologies

Some of the selected programs fit into multiple categories, which underscores the increasing complexity of Government IT programs as well as the concerted effort on the part of most agencies (at least within the National Security arena) to move towards an expanded use of COTS and best commercial practices. Downsizing in DoD and the decrease in available resources after the end of

the Cold War have precipitated the latter two phenomena.

In addition, the Team found that many of the successful programs demonstrated an increased effort in the establishment of true Government-industry partnerships. Finally, most of the successful programs in this study had a foundation in Web technologies. This trait reflects the environment in the private sector.

Special Observations

During the course of its study, the Task Force was able to make a number of additional observations about the successful implementation of IT programs in the National Security sector of the Federal Government.

Web Technology

Of the programs that were originally nominated, fully 50 percent exhibited some use of Web technology, and of the programs finally selected as representative of best practices, almost 60 percent used Web technology to a significant degree. It is clear that the use of Web technologies has gained in popularity throughout the DoD and other National Security-associated Government agencies. The result has been the implementation of programs that represent thought leadership in areas such as knowledge management, while improving service to customers within every agency and in certain cases to American citizens. Innovation has been key in the wide use of Web technologies, as agencies have combined in-house and vendor expertise to address problems and create solutions that are user-friendly, efficient, and cost-effective and that contribute to the goals of the Government Performance and Results Act (GPRA). Web-based solutions have contributed to the achievement of the Agency's mission while also increasing customer satisfaction significantly.

Customers

Continuing a trend observed in the 1997 study, agencies in this iteration also exhibited a strong predilection towards serving the customer. Although in many cases a project was undertaken literally because "it just needed to be done" and little consideration was given to customer

satisfaction, as the project progressed, customer satisfaction generally improved. Even in those cases where initially no effort was made to measure customer satisfaction, it became obvious to the program managers of all of the successful programs that customers were happier because of the particular program's effect on their work or lives. In those instances, program managers were spurred to increase the implementation time for the project, to make improvements, or to begin to measure the program's customer satisfaction to provide metrics for that program's success. Customers have really become the focal point for most program's efforts and customer satisfaction is now one of the key measures of a program's success. The days when the customer was not a factor ("it just needed to be done—we don't care about the customer") are, indeed, history.

Industry Partners

Two years ago, leaders in the Federal Government talked about the need for forming true government-industry partnerships. At that point, however, the pain was not yet great enough in terms of available resources, so the issue of partnership with industry was widely discussed, but no action was taken. Each year, the issue was resurrected with little or no real progress made. Industry, too, "talked a good game," but continued blithely down the path of giving the Government customer solutions that industry thought the Government wanted. As one DoD IT leader succinctly stated: "You in industry are too much like me. You tell me what you think I want to hear instead of providing solutions I actually need." The Team this year found that in the programs that have been successful there was extraordinary Government-industry cooperation. The corner has obviously been turned, and actual partnerships are appearing more frequently. In every case in which a vendor was deeply involved in a program, the Government program manager mentioned the vendor in very favorable terms. In several instances, the Government expressed pride that if one visited a particular program where Government and industry were working together, one could not differentiate between the two, because the relationship and interdependence were so close.

COTS Challenges Continue

The Team discovered that the Government has continued to make positive strides in the use of COTS products, hardware, and software solutions since the 1997 study. It has done so primarily for the following three reasons:

♦ Continued downsizing and attrition of skilled IT personnel and the subsequent inability to recruit from the private sector

♦ Reduced or "flat" IT budgets, which do not allow for in-house development and fielding of software

♦ Increased availability and large cost savings associated with COTS, which are developed in order to compete in the commercial market

Nevertheless, there continues to be some challenges connected with the widespread use of COTS.

♦ **Reluctance to Change Processes**. The full effectiveness of COTS is sometimes not realized. In some cases the Government is unable or unwilling to make adjustments in its own business practices so that a COTS solution may be fully implemented. Thus, an 80-percent solution, which could become a 100 percent solution with minor adjustments to business processes, goes unused because of the Government's reluctance to change those processes. The result is that, in some instances, the Government decides that a COTS solution cannot be used, because it is not a 100-percent solution, and an in-house version must be developed, usually at greater cost both in the long- and short-term.

♦ **Lack of Understanding of the Customer's "Culture."** In several instances, the Government has expressed concern that the vendor simply "does not know my business." Consequently, the logic implies, the vendor could not possibly develop and implement a solution that would satisfy a particular project's requirements. Therefore, the Government agency thinks it is forced to develop and implement a solution in-house, which is, in fact, a customization of a COTS product. This rationale is sometimes used for at least two reasons: (i) a genuine concern on the part of

the Government that the vendor simply cannot do the work and meet the customer's requirements; and (ii) a fear of loss of jobs if the vendor can demonstrate an ability to accomplish the work to the highest standards. The Team found many instances where agencies demonstrated excellent in-house capabilities in the development of software and solutions. However, although many agencies can be justifiably proud of their in-house capabilities to develop solutions, the full advantages of COTS are sometimes lost because of a prevailing not-invented-here syndrome.

♦ **Not All COTS Is COTS**. This problem surfaced in the first study and the Team found that it has not completely disappeared. Although it is necessary to customize COTS on occasion, the customization can be carried to extremes, in which case, COTS is no longer COTS—it is no longer the solution found in the commercial world, and a problem subsequently develops because it may no longer be compatible with other true COTS packages, and it may actually result in higher costs because it will not accept version upgrades.

The variant of the previously mentioned problem—selection of a product that is not widely implemented in the commercial world—did not appear to be a particularly severe problem in this study. Practically all instances of COTS implementation were made using mainstream COTS packages and products that had found widespread use in the commercial world.

Consolidation of Systems and Programs

One of the major advantages of current technology is not only the opportunity to eliminate old and costly legacy systems, but also the ability to consolidate several systems, programs, and databases into one, or at least, fewer. In several instances the Team found that this year's successful programs were able to take full advantage of the advances in IT to eliminate legacy systems, consolidate duplicative systems, combine programs, and reduce the size of databases and the number of data elements significantly. This simplified large, complex systems and eliminated, or at least reduced, the

number of problems and the amount of downtime experienced by customers. The result was more-effective, user-friendly, and widely accepted programs, with significantly enhanced ROI.

Cultural Adjustment

As in the private sector, the advent of IT in the public sector has brought with it concern among Government workers for their future. Throughout the study, the Team found almost without exception, that Government employees directly or indirectly affected by the implementation of IT programs felt threatened. Consequently, these employees were much less enthusiastic about the programs than were the program managers and others directly involved in the project. The single biggest barrier to successful implementation of IT programs has been the employees themselves— not the technology.

However, the Team also found unique solutions to this particular phenomenon. In almost every instance the program manager or the CIO anticipated the problem and implemented steps to avoid it completely or at least ameliorate it. Solutions ranged from ensuring that there was employee "buy in" at every level of the program's progress to direct involvement by the commander himself, in one instance, who made it clear to his subordinates that they would be evaluated on their ability to ensure successful implementation of the program. In each case, the result was a successful implementation. Most important, satisfied employees felt less threatened by the technology and saw firsthand how it could actually improve their working environments and ease their workloads, while freeing them to accomplish other tasks.

The problem of cultural adjustment will never disappear—new technologies will always pose a threat to some because of the unknown. The key is to anticipate it, plan for it, and determine the best way to dampen its effects. Change management is an integral and critical aspect of the introduction of new technology.

Strong Leadership

During the conduct of the study, one aspect exhibited by every one of the nominated IT programs was strong leadership. Sometimes it

was the CIO who exerted the leadership and at others it was instilled by the direct involvement of the senior commander. In every successful case, leadership involvement was absolutely critical, but that did not mean an environment of micromanagement, where every move was observed and evaluated. Rather, the leaders created environments of active support for the program managers and their staffs. The subordinates and employees subsequently wanted to be successful and were left to create solutions, rather than having solutions force-fed to them. The result was that those charged with creating and implementing the solutions felt empowered to do so and therefore were able to get the support of their employees for the project. In the final analysis, there was a marked degree of enthusiasm apparent in all the individuals involved in the programs; all felt themselves to be an integral part of the success of the program.

The Chief Information Officer's Questions

Just as in 1997, the Team in 1999 posed the three key CIO Questions to each of the nominated projects. Also referred to as Raines' Rules (because Raines had urged these same questions on the CIOs when he was Director of the Office of Management and Budget), the questions were as follows:

♦ Should the department / agency be in this business?

♦ Should the department / agency be doing it or can someone else do it better (cheaper)?

♦ Were the business processes reengineered before technology was applied?

The intent of the questions is to ensure that the Government is receiving a positive return on its IT investment. After posing these questions during the study, the Team had three observations: (i) it was rare indeed to hear that a department or agency should not be in this business (however, there were at least two instances of that); (ii) in the instances where an agency felt it should not be in this business, it had taken the next step and developed a solution whereby the business was in effect outsourced to the private sector; and (iii) business processes were not always

reengineered before application of the technology, because it actually made infinitely better sense and was more cost-effective to do it during or after implementation. The thought in the last instance was that it was better to have a 50 percent solution up and running now rather than wait for a 100 percent solution in the future.

Return on Investment

Again this year, the Team raised the issue of ROI with each of the departments and agencies that nominated programs for evaluation as examples of best IT practices. Again, the Team considered its role to be one of reporting observations, rather than evaluating the reported ROI. General observations about ROI were as follows:

♦ As in 1997, there was no projection of ROI for some of the projects that were nominated. In many of the same cases there was also no computation of ROI.

♦ Once again in several instances the main driving force for the project was simply that "it needed to be accomplished," rather than an analysis of alternative solutions.

♦ There still remains no clear and consistent definition of ROI. In most cases, program ROI appeared to be primarily determined by customer satisfaction, or in the case of Web-based solutions, the number of hits on the site.

♦ Most programs still do not account for all costs in calculating ROI. Very few programs, for example, included personnel costs in calculating ROI.

♦ Although there is still uncertainty about how to accurately calculate ROI, many programs were able to present data that demonstrated true ROI. In general, therefore, the Team observed some improvement in the ability of program managers to present true ROI when compared to 1997observations. Although some ROI metrics remain intangible, almost all programs demonstrate some element or elements of ROI—either in "paper saved," or reduced costs, or elimination of personnel dedicated to administration chores, or increased customer satisfaction. The point is that there is realization of the importance of ROI beyond customer satisfaction.

Concluding Observations

The 1999 project focused on the specific area of National Security, and therefore the IAC Task Force was able to concentrate on a very few of the Government's agencies—DoD, including the Intelligence Community; the Department of State; and the Federal Emergency Management Agency (FEMA). One of the results of this focused study was that the Task Force was able to observe in greater detail a smaller number of programs than in 1997. In general, the Task Force found the programs to be more mature. In addition, as a result of this year's study, the Team made the following concluding observations:

♦ The CIO's role and influence has increased dramatically since ITMRA was implemented, especially during the last 2 years

♦ Concerning ROI, there is still a lack of accurate calculation, largely because of a lack of measurement of baseline costs before a project is undertaken. There is still a general consensus within the agencies studied that a project is undertaken "just because it has to be done."

♦ Work performed by Government workers is still largely unaccounted for and thus is seen as free ("Government workers are on the job and being paid anyway").

♦ ROI could be useful as a true measurement of success, but it is still for the most part incompletely implemented—although progress has been made since 1997.

♦ Since 1997, impressive progress has been made in the implementation of IT to improve the efficiency and effectiveness of efforts in the area of national security. IT is truly seen as more than an "enabler"; it is now considered absolutely essential if DoD and the other national security agencies are to be successful in accomplishing their missions.

♦ The most difficult barrier continues to be in the area of human issues, not in the area of technology.

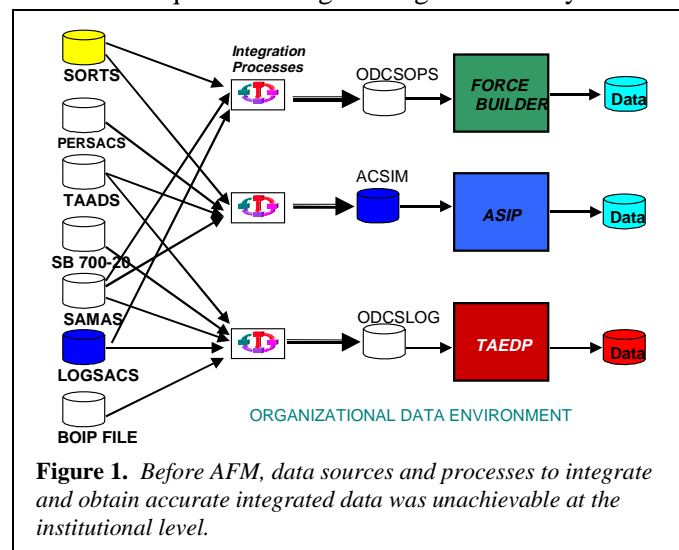| The Case Studies										
	Automation of Manual Processes	Best Commercial Practices	Consolidation of Systems/ Programs	Defining/ Delivering New Services	Document Management	Executive Information System	Information Delivery and Sharing	Knowledge Management	Project Tracking	Technical Insertion (COTS)	Web Technologies
Army Flow Model	√		√			√	√	√		√	√
CIT-PAD	√	√		√			√			√	√
DFAS Strategic Planning Process	√		√		√		√				
DT Mall	√	√		√							√
Joint Group for Web Initiatives				√			√	√			√
JX: Knowledge Today	√	√	√	√	√	√	√	√	√	√	√
Living Disaster Recovery Plan	√		√	√		√	√			√	
NEMIS	√		√	√		√			√	√	√
Paperless Career Field Designation	√			√		√	√	√		√	√
PLETHORA	√				√					√	
Procurement Gateway	√		√	√			√				√
Strategic War Planning	√	√	√			√					
STS/ODD	√			√	√	√			√		√
Web Invoicing System	√				√						√

Army Flow Model

Agency: Office of the Director of Information Systems for Command, Control, Communications and Computers (DISC4), Strategic and Advanced Computing Center, Department of the Army

The Army Flow Model (AFM) was conceived to provide a system to support the Chief of Staff and Vice Chief of Staff of the Army (CSA/VCSA) in decision making. It is a tool that allows Army senior leadership to observe the impact of policy decisions in the context of actual or conjectured scenarios and resource constraints across key functional areas of the Army. By using process management and the latest in data base technology, the AFM has succeeded in integrating data and processes throughout the institutional Army that have for years been controlled by select individuals.

The Army operations and force structure activities of the 1990s mandated a need for quick turn-around, what-if analyses of new force structures. Examples of such activities are the relocation of U.S. forces from Europe, the downsizing of the military, and base closures worldwide. A very recent factor is the infusion of information technology into the force structure. This has implications for equipment configuration and distribution; personnel acquisition, training, assignment, and career progression; and tactical and strategic operations. Mission flexibility has become the standard mode of operation. It could be argued that these conditions constitute a new set of

requirements for analysis and responsiveness from the Army staff.

The institutional Army, which consists of the agencies tasked with building, manning, equipping, sustaining, and maintaining the force was not prepared to respond quickly to these new requirements for information. Instead, the data needed for force structure analysis was supported by separately developed and fielded proprietary systems incapable of interfacing with other systems as represented in Figure 1. Overcoming these interoperability problems, and addressing the need for "real-time" analysis of force structure issues required a reengineering of the Army's
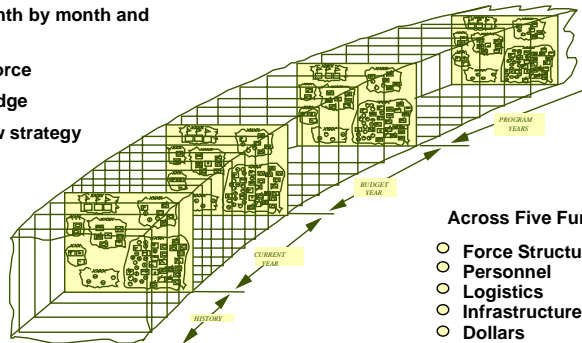

Figure 1. *Before AFM, data sources and processes to integrate and obtain accurate integrated data was unachievable at the institutional level.*

Figure 2 *The AFM provides an integrated view of corporate data in support of Army readiness now and in the future.*

critical to AFM success: the Headquarters Department of the Army (HQDA) Data Warehouse. This initiative was conceived to provide data sharing across functional areas in support of decision-makers. Its objective is to provide a single database fed by physically distributed databases located within each functional component. This unified database could then become the authoritative source of accurate, consistent, integrated data that would feed the AFM.

operational architecture. The result is a centralized modeling tool called the Army Flow Model (AFM) supported by Army corporate data. This model allows "real-time" data analysis against actual or conjectured scenarios to changes in policies, priorities, and other "real-time" factors. The AFM integrates data and processes that for years had been controlled by select individuals.

The AFM project, which began in September 1997, is a collaborative effort among the Army CIO's office, Army functional staff, and support contractors. Before September 1997, the AFM was seen as a CIO project and had no functional support or funding from the staff. Understanding the value of an integrated modeling and data processing environment, the CIO was able to convince the Deputy Chief of Staff for Operations (DCSOPS) to become the functional proponent. The CIO continues in the role of material developer and also provides continual interaction among the CIO's staff, the contractor, and the owners of the Army's sub-processes and data.

With the DCSOPS providing the priority and funding necessary to get the AFM started, there was another Army initiative that was equally

The AFM is a decision support system that has given Army staff an integrated, quick turn-around planning tool to assess actual or notional force structures and policies across the Army's major functional areas of force structure, personnel, logistics, installations, and budget. The AFM allows the Army to speak to a single, unified plan and for the first time allows decisions to be made from an integrated Army perspective instead of a purely functional one. The model displays the status and capability of the Army over time from the current year through the last year of the
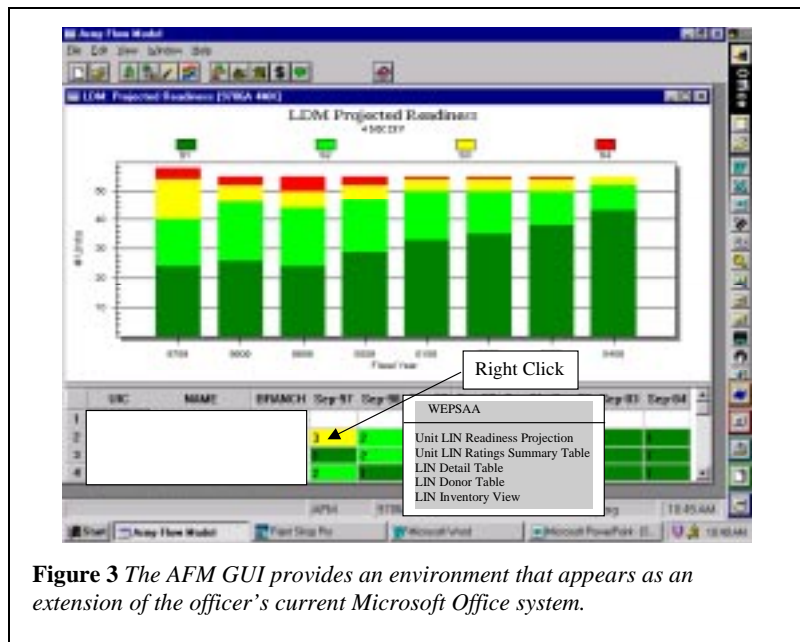
Figure 3 *The AFM GUI provides an environment that appears as an extension of the officer's current Microsoft Office system.*

Program Objective Memorandum (POM), thus allowing the senior leadership to focus on the actions and policies that may cause divergence from the desired end-state. This has permitted development of coordinated guidance by the CSA/VCSA.

Technically, AFM is a distributed object-oriented suite of models and an integrated database operating on a distributed, heterogeneous environment of Sun UNIX workstations and IBM-compatible PCs. AFM was written in C++ and JAVA and uses commercial off-the-shelf (COTS) software applications that have reduced both developmental costs and time. The system's controlling setup and analytical Graphical User Interfaces (GUIs) are designed to operate on IBM-compatible computers as well as UNIX workstations and can also be run as a stand-alone model. This design allows AFM's users an environment that appears as an extension of their current Microsoft Office system.

The AFM provides an opportunity to perform these force structure analyses faster and with more confidence than its predecessor systems. For example, the Total Army Equipment Distribution Plan (TAEDP) model was run five times a year: once a quarter and once for POM preparation. This represented a rough limit to the number of excursions that could be performed. Constraints were the time required to set up, execute, check, distribute, and interpret the information from the model. The Logistics Distribution model in AFM conducts analyses much faster than TAEDP, allowing something on the order of eight runs per month. This difference represents the acquisition of a critical analysis capability as well as cost savings to perform these analyses. Before the AFM, a conservative estimate of the effort to perform a force feasibility study was 8 hours a week for 2 months for each of the approximately 50 analysts involved. Currently, the effort is in the order of 2 hours a week for 1 week for 1 analyst. This represents a savings of 87 percent, an annual savings of approximately $532,000, which can be used to increase productivity from 5 analysis runs to 40 a year. This does not suggest a reduction in personnel; rather, it is a dramatic increase in productivity for a portion of the work force that costs more than $600,000 a year.

In 1997, the annual Defense MegaCenter budget for TAEDP was $956,600, which covered the operation and maintenance of the mainframe system in Huntsville, Alabama; the production of five TAEDP runs a year;

data retrieval and storage; and customer product distribution. With AFM, the TAEDP operation at Huntsville has been reduced to a requirement to load records into the Logistics Integrated Data Base (LIDB) at approximately $50,000 a year—a function that will cease with the forthcoming ability to load these files electronically. Even with the remaining manual operation at Huntsville, the annual savings from the use of AFM exceed $900,000 a year.

Other savings and benefits in personnel are projected at an estimated $1 million. As a proposed force structure, change is evaluated, retraining and reclassification costs of soldiers will be included in the model to allow analysts the ability to identify associated manning and retraining costs associated with the force structure conversion (estimated savings $1 million). The AFM will provide a much closer prediction of estimated permanent change of station (PCS) costs based on actual or proposed force structure changes and allow the Deputy Chief of Staff for PERSCOM to more accurately program PCS funding. It will also identify potential budget problems and allow personnel and force structure analysts to reexamine proposed changes in detail to determine their affordability.

Compared with methods previously used or existing alternatives, the AFM reduces the time and cost for AOs in Office of the Deputy Chief of Staff for Logistics (DCSLOG) to produce reports. Estimates of annual savings to DCSLOG in analyst report preparation times are $23,560. In addition to the cost savings, the improved response time allows more current data in the reports and the potential for shorter decision cycles for report users. Other benefits have occurred in the Office of the DCSOPS. Previously, AOs had not had the technical capability nor the personnel to manually calculate all costs associated with force structure changes. With AFM, potential savings include visibility of hidden costs of force structure changes that have never been identified or analyzed before at

HQDA. This projected savings is calculated to be in excess of $1 million and possibly as great as $10 million annually.

FY98 work set the stage for increased Return on Investment (ROI) as additional models are completed in FY99 and beyond. It is anticipated that in FY00 the AFM will be able to sustain its development and operations (an average savings of $3 million a year) based on ROI returns.

The AFM owes its success to clear direction from the CIO. His guidance to the AFM team was to enable analysis, not to do it. With that in mind, the AFM has succeeded in providing Army Staff Officers with the tool to answer cross-functional business area questions, using live data, real-time while providing cost savings in excess of $5 million across the institutional Army.

Additional information about the AFM may be obtained by contacting CPT Lisa Keller, Army, Office of the Director of Information Systems for Command, Control, Communications, and Computers at (703) 614-6902.

Commercial Information Technology Product Area Directorate

Agency: U.S. Air Force, HQ Standard Systems Group

Air Force initiatives to reform and streamline the acquisition process led the Air Force Electronic Systems Center's Standard Systems Group (SSG) to develop a bold acquisition strategy for the new Information Technology Tools (IT2) acquisition program. By evaluating the value-chain and adopting leading-edge commercial practices, the Commercial Information Technology-Product Area Directorate (CIT-PAD) IT2 team changed the way the Air Force does business. The results are a streamlined, easy-to-use ordering process for customers; savings for the Air Force and its contractors; and millions of dollars in savings for taxpayers. This revolutionary strategy could save the Air Force $50 million every year in personal computer savings alone.

CIT-PAD was established in June 1998 specifically to streamline the information technology (IT) acquisition process and satisfy current and future needs for its customers, the Air Force, and other Government users. Some of the issues it addressed include the following:

♦ The process of buying computer equipment and support was too long; often, hardware was obsolete when it was delivered. Using traditional Government buying practices, the Air Force buying office needed 11 months to place the first order.

♦ Awarding hardware and support contracts cost the Air Force $1.8 million in labor and overhead. Contractors each spent millions of dollars to prepare proposals and compete for contract awards.

♦ Each buying office in the Air Force had to perform its own market research. Precious manpower was spent studying the computer hardware and services markets, repeating what had already been done elsewhere. Developing acquisition strategies and writing Acquisition Plans, soliciting proposals, evaluating offers, negotiating and writing contracts—each buying office was reinventing the wheel.

A select team was handpicked based on ability and experience and then empowered to implement a radically different system. The team—consisting of professionals representing the program, contracting, and legal offices—began by establishing goals and objectives to guide its actions, including the following:

♦ Partner with industry and use their best-practice methods and lessons learned.

- Leverage volume buying power to lower costs, reduce acquisition cycle times and costs, and obtain quality products

- Support Joint Technical Architecture (JTA) and Defense Information Infrastructure Common Operating Environment (DII COE) compliance standards.

- Attain Air Force socio-economic goals by establishing an aggressive 23 percent goal for small business that exceeds the Air Force small business goal.

- Continuously improve the acquisition process throughout the Blocks by incorporating lessons learned and best practices from previous contracts and acquisition efforts.

- Provide quality vendors, and through an aggressive technology refreshment process, offer customers the most current, commercial off-the-shelf (COTS) products available.

- Offer value by structuring an *easy ordering process* for customers.

- Stay flexible in the marketplace by creating vehicles that are easy to establish (and replace when necessary, because of poor performance) and are able to react to the chaotic IT marketplace of mergers, takeovers, and innovations.

After extensive market research and a coordination process with both Government and industry representatives, a 5-year overarching strategy giving SSG the ability to plan and acquire $5 billion worth of IT product and service contracts was agreed to. A key component of this plan is the establishment of multiple concurrent contractual vehicles in place for their customers' requirements, thus ensuring an adequate supply of leading-edge IT products and services at competitive prices. The outcome from the reengineered process was:

- Reduction of Air Force acquisition costs to $60,000 (versus $1.8 million). Contractors competing for IT2 awards prepared proposals in a few weeks, which cost tens of thousands of dollars, not millions.

- Expansion in the procurement choices available to the Air Force and at the same time a savings

to taxpayers of an estimated $70 million each year in computer hardware purchases. Unlike earlier contracts, for which prices were set, companies compete continuously with each other for orders placed against GSA Blanket Purchase Agreements.

- CIT-PAD has been designated the Air Force Marketing Analysis and Pricing Center of Excellence for Information Technology (SAF/AQ Lightning Bolt 99-3).

CIT-PAD has reduced cycle times for making information available to its customers by automating updated information using the latest Web technologies. Program or project managers, who generate much of the information associated with CIT-PAD contracts, can drop their ready-to-post data in a shared folder that is a click and a drag away from all Internet and MILNET users, thus releasing news, announcements, product tables, or contract modifications without the administrative burden of paper. CIT-PAD has reduced its cycle times to process and re-process data by more than 1,800 percent. Process timelines were accelerated from 3 to 4 days to 3 to 4 hours.

As part of an extensive business process reengineering effort, CIT-PAD's Web site is being upgraded to a full-scale electronic mall as the Air Force's representative for the DoD E-Mall's IT Corridor. CIT-PAD is aggressively pursuing upgrading the site to become the single presence for processing all orders, International Merchant Purchase Authorization Cards (IMPACs), or down-loadable forms. CIT-PAD will collect and provide extensive user, Major Command (MAJCOM), or contract demographic information.

Customer acceptance of the site is very favorable, as is evidenced by the 10,000-plus visits to the site each month. Integral to CIT-PAD's business processes is how it organizes, distributes, and displays information on its Web site. The site provides information about 33 contractual vehicles across 9 programs with total values exceeding $9 billion. CIT-PAD offers links to eight of its vendors for online ordering sites via the IMPAC card. In addition, two sites have electronically modeled the entire delivery order process from selecting the product to mailing the

delivery order to the vendor. New purchasers (IMPAC users) to their Web site are provided with the comprehensive information necessary to make an informed information technology product purchase without outside intervention.

The benefits to the Air Force and American taxpayers are evident when comparing the traditional methods used in 1998 with the newer Web-based system begun in FY 1999.

The mission is straightforward:

♦ Provide an affordable, attractive, readily available, and easily accessible source of supply for commercial IT products and services.

♦ Provide leadership, guidance, and overall management and administration of a series of contract vehicles that support development,

implementation, and sustainment of the DII and warfighter support systems from base to DoD level.

♦ Assess new hardware and software technology and rapidly insert selected technologies into assigned contracts.

♦ Implement standard, repeatable processes and applicable procedures across contract vehicles facilitating technology refreshment and mission accomplishment.

In addition, CIT-PAD sponsors two annual events: the Small Computer Technical Conference (SCTC) in spring and the Air Force Information Technology Conference (AFITC) in fall. Both events are designed to acquaint users with the latest commercial technology and gather feedback from customers. CIT-PAD also sponsors a semi-annual industry interchange whereby it shares with industry ideas about the direction it will take in the next 6 months and allows for interchange between Government and industry to explore how to better serve its customers.

Organizational Identification

Further information may be obtained from LtCol Glenn E. Taylor at (334) 416-3464 or fax: (334) 416-6467; 501 East Moore Drive, Maxwell AFB-Gunter Annex, AL 36114-3014

	FY98	FY99	% Delta
Program Cost	$6.9 million	$7.5 million	8.7%
Number of Contract Vehicles Supported	11	32	290%
Cost per Contract Vehicle	$627,000	$235,000	(62.5%)
IT System Cost	$1.8 million	$1.4 million	(33%)
Manpower Staffing Authorized	~118	78	(34%)

Event	Before	After
Acquisition Cycle Time	18 months	30 days
Acquisition Cost (Desktop Vehicle Example)	$1.8 million	$60,000
Contract Product Refresh Cycle	30 days	1 - 3 days
Desktop Product Discounts from GSA	3% - 10%	30% - 38%
Based on 100,000 Systems Sold Annually, Savings on PII 450MHz, 128RAM Reach *$70,400,000*	$2,135	$1,431

Defense Finance and Accounting Service Strategic Planning Process

Agency: Department of Defense—Defense Finance and Accounting Service

A reengineered enterprise-wide strategic planning process now provides the necessary management control over hundreds of different, non-standard systems that comprise the Department of Defense (DoD) finance and accounting operation. For many years the General Accounting Office had found serious problems in the finance and accounting (F&A) process at the Department level and recommended major re-invention to bring the organization into conformance with required practices. As the Defense agency responsible for implementing and coordinating F&A practices across the Department, the Defense and Accounting Service (DFAS) took the initiative to develop a responsive system through an enterprise-wide planning process.

Under the guidance of the U.S. Department of Defense (Comptroller), the DFAS provides the required leadership, including establishing the strategic direction, for DoD finance and accounting systems. DoD's organizational structure in previous years did not support cross-community functionality nor information exchange. Each of the military services and Defense agencies developed its own processes and business practices. As DoD military strategy shifted from service-specific operations to joint operations, the sharing of financial and other information became imperative. Moving DoD to a standard set of F&A business processes and practices across all communities is an arduous process, as hundreds of systems and thousands of people are involved. This evolutionary process requires strong central leadership and extensive collaboration among the stakeholders.

Currently, various accounting data are not managed from a DoD enterprise perspective. Therefore, many systems cannot share data. Systems that do share data often provide incomplete and inaccurate financial information due to incompatibility of systems and lack of standardization. Often, the quality of source data is degraded because the data is incorrect, incomplete, lacks precision, or is not sufficiently current. In addition, data degrades as it transitions from system to system due to incompatible interfaces, error prone mechanical processes, and process delays.

The difficulty in sharing information among finance and accounting systems, the lack of standard F&A processes and practices, and the weakness of internal controls are the root of multiple problems such as the following:

♦ Problem disbursements
♦ Unauditable financial statements
♦ Degraded data
♦ Multiple data entry
♦ Multiple instances of the same data
♦ Duplicate system interfaces
♦ Delays in obtaining data

♦ Manual reconciliation requirements

♦ Inability to trace transactions to source data.

The solution was seen as an improved strategic planning process. Keeping in mind the driving mandates that established performance requirements as national priorities, the Agency set goals and guiding principles for the development of its information management strategic plan. The plan identified goal flow-down to operating units and the process gained acceptance of the functional units of the enterprise. DFAS generated a plan, "DoD Accounting Systems Strategic Plan (DoD AS-SP)," to establish the strategic direction for DoD F&A systems migration. DFAS headquarters had the charter to establish and manage actions to achieve the DFAS target architecture. These actions include establishing a uniform accounting system architecture that facilitates efficient consolidation of legacy systems, defining and planning the information infrastructure, and laying the foundation for achieving a common operating environment.

The Strategic Planning process was the impetus for DFAS' effort to reengineer its business processes. It was built on the premise that the target environment will result in the following:

♦ DoD accounting management in line with financial management best practices implemented in the private sector and other Federal agencies

♦ Accounting system compliance with the rules, regulations, and guidelines established by Federal and DoD financial leadership

♦ Defense agency feeder systems that ensure financial data are properly recorded, data integrity are maintained, and reliable audit trails are captured

♦ Reduced fraud, waste, and abuse

♦ Performance measurements set by how well the organization accomplishes the objectives of the legislative and policy mandates.

At the same time, the planning process had to be complete enough to accommodate the entire DFAS program and to gain acceptance of its various stakeholders.

Involvement by key personnel and support by senior leaders were key factors contributing to the success of the effort. Dedication to a complete, comprehensive program and support from top management and operating units accompanied the commitment. DFAS accommodated its customer needs for modern and efficient finance and accounting systems that provide accurate, timely, and affordable financial information. In addition, the plan was developed by and is being implemented by individuals dedicated to the cause. Stakeholders were involved along the way to ensure that their interests and needs were accommodated.

While the DFAS has primary responsibility for its strategic planning, several vendors assisted. A collection of common services, tools, procedures, hardware and software platforms, standards, policies, communication facilities, and other integrated elements were used to provide shared, integrated access to corporate information assets in a compliant, maintainable, interoperable environment. Various vendors were used to help the DFAS achieve its target environment, including Oracle, Mitre Corp., KPMG, Arthur Andersen, EDS, Gradkell Services Inc., Chugash Development Corp.

The plan addresses the 10-year period from FY99 to FY08 with near-term being the initial 2-year period (FY99 and FY00), mid-term being the next 4-year period (FY01 to FY004), and long-term being the final 4-year period (FY05 to FY08). Collectively, the near- and mid-terms address the same 6-year period covered by the FY99 Defense Program Objective Memorandum (POM) budget. The long-term period addresses out-years, yet to be addressed by the Defense Planning, Programming, and Budgeting System (PPBS) process. A critical review of the new plan was performed in spring 1999. The plan is currently being implemented.

Previous attempts to move the DFAS to a single, standard management information system (MIS) had failed, primarily because of inadequate plans and customer resistance. The current plan, developed in concert with all of DFAS' customers, allows the DFAS to incrementally migrate to its target environment, that is, allowing DFAS to maintain service to its customers while

implementing the Corporate Database and Corporate applications in a cost-effective manner. The comprehensiveness of its scope and systematic manner of identifying relationships between requirements and operations were considered by the DFAS to be creative elements of the reengineered process. The Strategic Plan, with the resulting target environment, is the key ingredient needed by DoD and the DFAS to achieve meaningful financial management reform. The Plan implements an integrated, end-to-end procurement process and meets the requirements of recent Government reform legislation. It is as thorough an examination of requirements and resources as can be performed and the process was fully accepted by stakeholders.

The Strategic Plan and the resulting target environment were designed to maximize return on investment (ROI) in terms of cost savings and performance benefits to the DoD, as well as minimize development, deployment, and operational risks through identification and correction of deviations as early as possible. Having program and financial managers work in partnership to manage the financial information necessary to perform the Defense financial services mission resulted in accomplishment of all its premise objectives.

The most important lesson learned was that stewardship is necessary to promote such a process. This lesson became clear early in the process and was renewed throughout the development of the planning process.

The ROI for the project is measured by performance gains of the operating units served. Of particular value is time saving in the current planning cycle over previous efforts. Stronger partnerships were established among operating units as members of the customer community. The entire planning cycle now operates in a 2-year period, overlapping with prior and subsequent planning periods. This ensures continuity in planning that overcomes some of the limitations of the 2-year budgeting cycle for the DoD. The new process is comprehensive, complete, and fully integrated. It actually spawned a strategic support plan for one of the major program areas.

Additional information about the strategic planning process may be obtained from Marty Costellic at (703) 607-3947 or Bruce Johnson at (703) 607-0173.

DT MALL

Agency: National Security Agency

Web-based stores that permit quick comparisons of computer configurations, dramatically speed the ordering of hardware and software products, and eliminate duplicate data entry.

The Business Services Division of the National Security Agency (NSA) Directorate of Technology (DT) establishes contracts with vendors and encourages the entire Agency to procure hardware and software through the contract vendors. Before the creation of DT Mall, customers purchasing technology were confronted with the tedious, sometimes confusing task of determining which products were available to meet their needs, which in turn made ordering a complex and extremely time-consuming task for both customers and acquisition personnel. Price lists were published on the intranet Web, but appeared in varying formats and scattered locations. The lists contained many separate line items, each indicating a particular version of a software package or an individual component of a computer configuration. Thus, a customer needing a new computer had to build it piece by piece, choosing CPU speed, RAM size, hard disk type, monitor, and so on. Constructing a fully operational computer usually required the involvement of the contract manager, which made cost comparisons for different configurations from different vendors a labor-intensive manual effort. The customer then sent a memo to the local budget officer, listing part number, description, and price for each item individually as well as providing detailed delivery information. The

budget officer entered all data manually into the Purchasing Request system and cycled the request electronically through various approval levels. When the purchase request arrived in the acquisition office, the appropriate vendor vetted each computer purchase to ensure that the configuration was valid; when it was not, corrections had to traverse the process again, starting with the original customer. In summary, the ordering process was tedious, time-consuming, and extremely error-prone.

The DT Mall Initiative

In 1997 the Business Services Division created a prototype shopping-cart Web application that allowed customers to choose software from a single vendor and send the order via e-mail to the budget officer. The prototype was so successful that in 1998 a senior computer scientist was tasked to design and build a complete "mall" system of Web stores to facilitate the ordering of hardware and software from all vendors under contract to the Division. The first hardware store in the DT Mall became operational in October 1998 and was followed within a few months by additional hardware and software stores.

DT Mall was the first Web store application at NSA and the first application to connect directly to the Purchasing Request system. Its easy and fast ordering features, together with the elimination of time-consuming computer configuration research and error-prone duplicate data entry, made it an instant success. To create an order, a customer chooses a store from a

centralized DT Mall homepage, picks a category such as "desktop system" or "laptop peripherals" in a hardware store or "desktop publishing" in a software store, selects desired items, adds them to a shopping cart, and enters a minimal amount of delivery information. The store automatically supplies contract details, sources, and other "canned" data. When an order is complete, the store confirms the fact by e-mail and routes it electronically to the Purchasing Request system, where the budget officer has only to add funding information before moving it up the management chain. With no data entry, ordering is error free.

DT Mall incorporates many features that have contributed to its overall usability and immediate acceptance. Each store sells items from a different vendor but has the same "look and feel"; thus, there is no learning curve when moving among them. A search feature makes it easy to locate the correct category within a store. Help is available from every page and provides points of contact for technical and ordering questions, together with detailed information about store usage. Item-specific information is linked whenever it has been provided by the vendor. The View function provides a clean printout of an incomplete order and is often used to show managers proposed orders before check out. Data-entry is kept to a minimum through the use of canned information specific to each store, and the extraction of personnel names, organizations, and telephone numbers from the Agency-wide e-mail database. Unfinished orders are saved up to 2 weeks so that users can exit the Mall and return later to complete the orders at their convenience.

By far the most innovative and time-saving feature of the DT Mall hardware stores is the "configurator" capability. The configurators are special pages that allow customers to choose recommended standard computer system configurations by choosing options with the touch of a button or to customize configurations by choosing options such as CPU speed or hard disk size from pull-down lists. A calculator function allows instant price comparisons for different configurations and quantities. It is estimated that the configurator alone saves an average of 4 hours of customer time on each computer system order.

Mall maintenance currently requires a certain amount of effort, but this will shrink dramatically as contracts expire and new ones are established. Each vendor provides periodic price updates that must be incorporated in the appropriate DT Mall store. Unfortunately, the format of these updates varies from complex spreadsheets to simple, but differing, types of lists. Therefore, a separate set of preprocessing software had to be written for each store to convert the data to a common format and to separate the information into appropriate categories. The Business Services Division has developed standards for all new contracts, which will gradually eliminate this problem.

All software for DT Mall was developed in-house, using HTML and Perl. The designer intentionally avoided techniques such as frames and Java to ensure accessibility by customers using older computers or browsers. Tables are employed liberally, while Javascript adds bells and whistles, it is not essential to store operation. The Mall saves basic order information for use in tracking and in determining usage by Agency elements, but does not retain a full ordering database, as that information is sent to, and retained by, the Purchasing Request system. To track hardware purchases from initial order through end-of-life, the Mall will soon send ordering information to a new life-cycle management system, which is currently under development.

Bottom Line

DT Mall, embracing the concept of enterprise system management, has exceeded all expectations and will be extended to cover new hardware and software contracts. The Web stores have eliminated inconsistent and incomplete e-mail orders and obviated the need to consult contract managers and acquisition experts before initiating an IT order. They have made ordering much easier, more accurate, and trackable, resulting in huge time saving overall. In an era of Government downsizing, the time saved by customers, budget officers, and acquisition personnel is critical. The time required to create hardware orders was reduced by 90 percent, from 8.5 hours to just 55 minutes, with accompanying cost savings of 90 percent. Through the use of the DT Mall, NSA expects to realize annual savings of more than $300,000. These savings are

particularly significant, because the total cost of the project consisted of the Government salary of a single senior computer scientist. For her outstanding performance, the computer scientist was recognized in May 1999 with the DT Technical Achievement Award.

Additional information about the DT Mall program may be obtained from Louise Frankenberg at (301) 688-9612.

Joint Group for Web Initiatives

Agency: Defense Logistics Agency

A joint group charged with exchanging Web application information for logistics purposes. The Joint Group for Web Initiatives (JG-WI), as chartered by the Department of Defense (DoD) Joint Logistics Commanders, is tasked with institutionalizing Web-enabling initiatives across the DoD. Goal: Use the Web more effectively by leveraging knowledge of those who are "doing it better," and avoid unnecessary duplication of effort and associated costs.

With the growing popularity and use of the World Wide Web, the Defense Logistics Agency (DLA) recognized the existence of many unilateral efforts within the DoD to do logistics business on the Web. The DLA suspected that much duplication existed and bearing in mind the rapid changes in technology, the Department realized that keeping up with technology presented a challenge. Moreover, the DLA was aware that movement of personnel within the logistics community only exacerbated the problem of lost knowledge.

In a presentation to the Joint Logistics Commanders in early 1998, the DLA suggested creating a joint Web information exchange group comprising voluntary representatives from the uniformed services, the DLA, and other DoD agencies. In October of that year, all parties agreed to the initiative and to having the DLA—as the only "purple" or joint Agency—to lead the effort. The intent was for the JG-WI to be composed of principal representatives from each of the components and have associate members

from the components and many joint programs. In just 1 year, the JG-WI fostered collaborative efforts that have saved the DoD more than $100,000 in Web development costs—through solely voluntary efforts.

The JG-WI's mission is to encourage and facilitate initiatives that employ joint applications for conducting DoD business on the World Wide Web. The group shares information about Web-enabling efforts, new technology, and Internet trends. Members use lessons learned and new ideas from individual DoD components' efforts to identify opportunities for joint use.

Within the JG-WI, there are principal members from the DLA, Army, Navy, Air Force, and Marine Corps and associate members from such organizations as the Office of the Secretary of Defense, the Defense Finance and Accounting Service (DFAS), and the Joint Electronic Commerce Program Office. Currently, the JG-WI boasts nearly 90 members, including military officers and civilian employees.

All members are part-time for the effort, and there is no budget for what is essentially collateral duty. Each member performs the function for which he or she is responsible outside the JG-WI. Naturally, there are varying degrees of participation among members. Nevertheless, due in large part to senior level commitment, the group receives good participation from all components. Because members are invited—not compelled—to attend, there is more enthusiasm among participants. Everyone comes together

with an open mind to share, not defend, ideas. The process takes advantage of the natural tendency of system developers to learn from one another. At the same time, the group has higher level members who provide prescriptive input.

The JG-WI sought, first through its charter, then through its strategic plan development, to define the root causes of the dilemma it was asked to address. The group continues to seek issues to define its activities and action items. It inquires whether anyone is already involved in a potential solution and engages them in the process. The group seeks alternative methods to add value to, rather than to threaten, existing endeavors. Unlike traditional organizations, the JG-WI turns over all intellectual capital, processes, and information as soon as possible to the DoD community.

After the JG-WI kick-off, electronic fora (chat rooms) were instituted to promote discussion and exchange information. Currently, users can log into several fora based on the subject of interest, including data warehousing, Internet security, and interoperability opportunities. Subsequent efforts included the formation of the JG-WI Web site as a central repository of information. The JG-WI also holds meetings with the private sector to learn about private sector initiatives that could be replicated, as well as regular meetings with group representatives to exchange this information. These activities afford opportunities to share knowledge on applications and avoid expenditures. All knowledge gained from these efforts is made available through the JG-WI Web site.

JG-WI participants testify to the value the group brings. The rapid synergy of the joint group can inspire members to apply similar requirements within their respective agencies. Says Ron Tyler, the Marine Corps principal member, "It's extremely useful to share this information in a joint group setting with the purpose of avoiding new starts and duplication."

The participation of the commercial sector is a recent development that has contributed to this group's success. Through commercial representatives, members learn not only how to replicate commercial Web applications, but also about the general commercial practices built into

those applications. In this way, there is potential to modify business processes as a whole.

A number of factors are used to measure the performance of the JG-WI solution. The factors include the cost savings associated with those projects that were replicated as a result of the JG-WI, the number of hits on the JG-WI Web site and its discussion group, and the number of members participating in the group as a whole. Because participation in the group is voluntary, this last measurement is an excellent indicator of the group's success.

Already, the group can be credited with several instances where projects were able to replicate the knowledge of others. In collaboration with the JPO-Deskbook, the JG-WI added a Web-based calendar feature to the JG-WI Web site, saving $6,900 in development costs. The application has also been modified by a JG-WI member, representing the Defense Logistics Support Command (DLSC), for the Command's use. The JG-WI calendar was demonstrated to be sufficiently robust to meet DLSC requirements. As a result, a tailored version of a Web-based calendar was implemented immediately, without additional development costs.

In another example, for secure Web log-on, Army personnel were able to replicate a technique to implement Public Key Infrastructure (PKI), which was developed by the Navy for its One Touch System, the Navy on-line supply system. By using this same technique, Web engineers for the Army Electronic Product Support (AEPS) system estimated that they had avoided 2,120 hours of development time for a total savings of $116,388.

Other non-quantifiable improvements are:

♦ Establishment of a repository of Web functionality across the DoD

♦ Guidance and processes for Web application development

♦ Collaboration among Department logisticians

♦ Demonstration that the initiative does not require a massive monetary investment.

Several qualities make the JG-WI a Best IT Practice: As funding is reduced, the need for rapid, quality information increases and the

methods for acquiring knowledge grow exponentially; there is a natural rush by independent interests to solve unilateral needs. This *joint* effort exemplifies the best of the DoD—working together for common objectives and shared technology, while maintaining individual mission uniqueness.

Moreover, this is a group that has *no* budget and has been able to bring together people who otherwise might not have met for the purpose of learning from one another and saving money. Because their participation is voluntary, the simple fact that many people do participate is indicative of the value this effort brings. The JG-WI exploits information exchange and fosters

avoidance of duplication in a joint environment. It is a good example of using technology for knowledge management to create a repository of information. The bottom line: This is a replicable, useful IT practice that can be applied throughout Government.

Additional information about the Joint Group for Web Initiatives may be obtained from Rex McHail, JG-WI Lead, (703) 767-2174 or rex_mchail@hq.dla.mil. The JG-WI Web site's address is www.cio.dla.mil/jgwi.

JX: Knowledge Today

Agency: Atlantic Command, Department of Defense

Knowledge Today *is a Knowledge Management tool that operates on a classified Web site. It is designed to provide top officers in Atlantic Command (ACOM) a way to share information and collaborate on projects, and it therefore enables the members of ACOM to turn information into knowledge and to push that knowledge across the depth and breadth of the Department of Defense's largest command. Taking advantage of the Revolution in Military Affairs (RMA),* **Knowledge Today** *has thrust ACOM into the Information Age and placed it at the forefront of knowledge-based organizations.*

"You will be judged here by how well 'your information' was utilized by the organization; NOT by your cleverness in obtaining it."

ADM Gehman, CINC's Command Philosophy

ACOM is the Department of Defense's (DoD's) largest joint command. Some of the nation's most vital components are part of ACOM—Forces Command (Army); the Atlantic Fleet (Navy); Marine Corps Forces, Atlantic; and Air Combat Command (Air Force). Of the 1.5 million personnel currently on active duty in the military, ACOM has authority over 1.2 million. It is responsible for the defense of an area that encompasses most of the United States, the Atlantic Ocean from the east coast of the United States to Europe, from Europe to the west coast of Africa and then down the west coast of Africa and beyond. In short, ACOM is huge and complex.

To command such an operation and to be able to make decisions—many of which are potentially critical—requires not only extensive information and intelligence, but also the capability to move that information rapidly across the Command. Commanders and staff officers within the Command must know the critical elements of information and intelligence to advise the Commander-in-Chief (CINC) about the proper course of action for any contingency. In 1995, General John Sheehan (USMC) assumed command of ACOM, and he immediately assessed the information flow throughout ACOM, which was so critical to his success, to be practically inert. His deputy (DCINC), Vice Admiral (VADM) Hal Gehman, agreed wholeheartedly.

The manifestations of the problem were legion. ACOM's "stovepipe" organization, comprising eight directorates, most of which were headed by an admiral or general officer—J1, J2, J4 and J8 were headed by O-6s (Navy Captain/Army Colonel)—contributed to the lack of information flow. Information within these directorates, which are coded "J" for Joint, was considered a commodity. It was hoarded and not shared outside of the directorate; the old adage, "knowledge is power," was active throughout the Command. Thus, an officer in J-3 (Operations), responsible for the drafting of war plans, often did not know what his counterpart in J-4 (Logistics) was doing. J-2 (Intelligence) would not share intelligence outside its directorate, so the Command was unaware of critical intelligence

needed for the development of plans, policy, or logistics. Within the highly structured Command, it was an issue of "turf." A director would seldom consider releasing a plan or a report until it was 100 percent complete, and the officers responsible for the report often worked in a vacuum. They did not have the benefit of the knowledge of their counterparts across the staff. The result was that the members of ACOM, both military and civilian, felt isolated. They did not know the mission and were ignorant of the environment in which they lived and worked. In short, ACOM was inefficient. In the fall of 1995 General Sheehan and Admiral Gehman decided to take action to break down the barriers and to have the information flowing across the Command—in all directions. General Sheehan wanted even the lowest-ranking soldiers and sailors to have the same information that he had. He believed that a totally informed Command would be more productive and efficient and that morale would improve significantly.

The problem was further exacerbated by the fact that although the military was downsizing, the requirements for deployment and training were actually increasing. Furthermore, in order to change the "culture" in ACOM, a revolution of some significance would be required. The solution was the creation of a new directorate, JX ("J" for Joint, "X" for Experimental). Three officers, none of whom had experience with information technology (IT), were brought in to solve the problem of lack of information flow. In December 1995, the Decision Processes Division (JX) was inaugurated. The officers reported to the DCINC and thus had the full support of the CINC. It was understood throughout ACOM that the Commander himself had an interest in the project and that the project had his full support.

With no previous experience of IT, the officers of JX set out to develop a solution. They wanted to study other systems and visited a number of large organizations in the private sector, including PepsiCo, CNN, and Texas Instruments. They also approached a number of consulting firms for their contribution of information, and they ultimately decided that Logicon, Inc., a subsidiary of Northrop Grumman, offered the best solution. Logicon had recommended taking advantage of Internet technology and developing an ACOM

intranet, which was also interactive. The JX officers decided to turn the technology aspects over to Logicon while they concentrated on the military content of the site and the user interface. Logicon then did the programming and Web design and built the server systems.

Limiting new budget expenditures was critical for the success of the project. The Web solution itself was inherently cost-effective, and the infrastructure necessary to run the system was already largely in place. ACOM had a Windows-based e-mail system, which was a classified network. That was key, since the proposed solution had to be classified. The prime users would be ACOM staff officers with proper clearances. However, other staff officers throughout the Department of Defense could also call up ACOM's information, because the ACOM intranet interfaced with DoD's secret global network (SIPRNet). Costs could be kept minimal.

By the summer of 1996 the JX officers were ready to unveil their solution. JX itself had new offices and resembled a scaled-down version of the newsroom concept at CNN, although computer banks and TVs were not installed until 1997. The JX solution was touted in staff meetings prior to its launch as ACOM's intranet: *USACOM Knowledge Today.* In July 1996, *USACOM Knowledge Today* went live—a mere 8 months after the first officers formed the JX, their solution to General Sheehan's problem was up and running. The initial solution—"an 80 percent solution"—was bare bones and contained little depth, but it accomplished General Sheehan's' directive to provide an initial solution and continue work from that baseline. It was simple to use and the technology, e-mail and Netscape, was familiar to everyone in the command; people were more inclined to use *Knowledge Today* than they might have been if it had been more complex. Contents included a news summary and an intelligence update from J2, as well as links to eight other sites that contained information such as weather and schedules. However, the ingrained cultural resistance to change had its effect: the sites were not well populated and schedules were not revealed. At this point General Sheehan exerted firm control and direction by informing his commanders and staff officers that the sharing of information was the manner of business of the

future and that they would provide the necessary information, including their schedules.

Knowledge Today expanded rapidly. Newly arrived officers in JX took what their predecessors had started and built on it. Working with their industry colleagues from Logicon, they began to add one feature at a time to the ACOM intranet. As they built the Net's capabilities, they saw their readership increase from 1,500 hits a day in 1996 to 50,000 by the summer of 1997. The value provided by *Knowledge Today* was becoming evident to the ACOM staff. The number of hits rose so high that "hits per day" became irrelevant as a measure of the Net's success.

The benefits that have accrued to ACOM have been dramatic. Personnel throughout the Command are more productive because they are better informed and are not wasting time. Information is flowing vertically and horizontally, and morale has improved dramatically—from the highest to the lowest levels and among the civilian and military members of the Command. As an example of increased productivity, each day approximately 50,000 messages could arrive at ACOM's automated message system. Most are information-only type messages, but several hundred require some special handling or a response. In the past, two to three officers in each of ACOM's eight directorates would arrive early in the morning to screen all of the messages and assemble a Reading File in time for the 6 a.m. briefing to directorate heads. The problem was that 24 to 32 officers were all reading the same messages and not sharing the information contained in them. After JX added a message board to *Knowledge Today* in August 1996, the number of officers necessary was reduced to two. They simply post the most urgent messages and those requiring action to the appropriate Web pages, while the remainder are placed on the server and can be researched later. The other 22 to 30 officers can be employed in more productive roles throughout the Command. The result is that everyone who has access to the Web site can read the same messages the CINC reads and be fully informed about the CINC's top priorities. The staff can now work together, because all staff members have exactly the same information. ACOM can, therefore, be focused on the same key problems and issues.

The breaking down of old cultural barriers has also been a benefit. In the old "stovepipe" organization, information was hoarded and not shared. That environment encouraged the filtering of information at each succeeding layer of management. By the time information had flowed down to the lowest levels it had been filtered numerous times by each layer, which decided what was important and what was unimportant. Now, everyone possesses exactly the same knowledge and can act quickly. Information flow is speedy and accurate.

Another benefit has resulted from the addition of collaboration sites to the ACOM intranet. In one case, an ACOM staff officer, who was doing research as a strategic planner, needed to collaborate with more than 60 experts—military as well as scientists at universities—all across the country. He was able to conduct his research almost entirely on the collaboration site, in near real time. The result was that the officer accomplished in 3 months what would previously have required 2 years and in addition, the officer saved on travel costs.

Military-Industry Partnership has been another benefit of *Knowledge Today*. The contractor, Logicon, is an integral part of the organization. It has been a team effort from the beginning, and the work was all completed from existing contracts, which were rolled into one contract.

Knowledge Today is replicable and adaptable. Several agencies within DoD, including the European Command (EUCOM), and other Federal Government agencies are considering replication of *Knowledge Today* for their own purposes. The templates for *Knowledge Today* are now being modified and adopted by OSD C3I, which, in turn, is sharing them with the Navy Space Information Warfare Command and Control Directorate (N6), the Army Staff, and possibly, in the near future, the National Guard Bureau.

Costs have been minimal, while the Return on Investment (ROI) has been high. Initially, $880,000 a year was programmed for JX operations. However, actual operating costs were much lower. JX spent approximately $350,000 to $400,000 a year for its first 2 years of operation. These costs included the purchase of the hardware and software needed to stand up the *Knowledge*

Today site; contractor funding to build the applications; and associated travel, office supplies, and miscellaneous expenses. The actual cost for 1999 is $440,000 a year; of which $400,000 is for contractor costs. The site is now 40 times the size of a traditional Web site. ROI can best be measured by observing the breakdown of old barriers and the resultant free flow of information throughout the command; the savings achieved in elimination of paper; the reallocation of manpower from administrative duties to other, more productive duties; and reductions in travel costs.

Why was the ACOM intranet successful? First, there was total support from the very top of the chain of command. The CINC did not micromanage the effort, but he emphasized to all commanders and staff officers in the Command that they would be graded not on how much information they knew, but rather on how much information they shared across the command. This ensured staff support and the staff, in turn, became dedicated to the success of the project. The JX officers responsible for *Knowledge Today* kept it simple. They started with simple projects, and they added to the intranet as they moved forward. No complicated technology was involved, just the technology that was readily available and familiar to everyone throughout the Command. *Knowledge Today* was—and is—very cost effective. Finally, the JX officers targeted first the members of the Command who were non-believers and won their support.

JX: Knowledge Today went "live" in July 1996 as an 80 percent solution to ACOM's information flow problem. However, as capabilities have been added and as ACOM's members have become accustomed to depending on the ACOM intranet to accomplish their mission, the old cultural

barriers have fallen and *Knowledge Today* is an integral part of ACOM. The JX staff feels that there is still much work to be accomplished and that it will require another 1 to 3 years to reach the point where ACOM is a true knowledge-based organization. However, it is evident that *Knowledge Today* is a solid success story. Currently, the site is growing at a rate of 5 percent a month in terms of information available and the number of people using the site. It is a military-industry partnership; it took advantage of existing technology and infrastructure to keep costs manageable and to get a solution on line rapidly in order to satisfy the CINC's directive. Perhaps the greatest measure of its success is that it is constantly being visited by outside agencies, both within the Federal Government and from the private sector. The Navy Space and Naval Warfare Systems Command (SPAWAR) office has a liaison officer at ACOM and the Army Night Vision office has used some of ACOM's efforts. The Department of State, the Internal Revenue Service (IRS), and the Environmental Protection Agency (EPA) have all visited ACOM and *Knowledge Today*. It has brand recognition, not only throughout ACOM, but throughout the remainder of DoD, also. Among other awards, it has been recognized for 3 successive years— 1997, 1998, and 1999—by *CIO WebBusiness* magazine as being among the 50 Best Intranet Sites. However, the greatest form of recognition may lie in replication, and John Deere Co., after observing firsthand the capabilities of *USACOM Knowledge Today*, has decided that it will develop its own version – *DX: Knowledge Today*.

Additional information about USACOM Knowledge Today may be obtained by contacting LTC Don Jones, e-mail: jonesdon@series2000.com

A Sample page from the USACOM: Knowledge Today Website. This page displays the broad spectrum of information and intelligence available to the members of the Command, as well as the ACOM Commander's top priorities. Knowledge Today is updated continuously and also permits members of the command to add information to the site.

Living Disaster Recovery Planning System

Agency: Defense Finance and Accounting Service

> *The Living Disaster Recovery Planning System (LDRPS), an enterprise-wide contingency planning system, allows the Defense Finance and Accounting Service (DFAS) to address natural and man-made disturbances around the globe with standard DFAS-wide "dynamic" plans, that can respond to an infinite number of disasters and can be developed and maintained at the lowest levels of the Agency and rolled- up and accessed at the highest levels.*

Developing and maintaining dynamic contingency plans to adequately respond to an increasingly risky environment is essential for the survival of any organization. Recent natural and man-made disturbances around the globe, including Year 2000 issues and terrorist activities, such as the Oklahoma City and the World Trade Center bombings, have heightened the awareness and need for business continuity of operations plans for DFAS. In addition, since 1996, numerous executive orders have required DFAS to develop various aspects of contingency plans; the Department of Defense (DoD) Authorization Act for FY99 included a provision that requires DoD to have in-place contingency plans for all critical missions.

Because it is the paymaster and accounting agency for the DoD, it is imperative to national security and the DoD's financial integrity that DFAS have viable contingency plans in place to ensure continuity of its core and core-support business processes. This is no easy task, given the size and worldwide dispersion of the operations. A sample of monthly fiscal transactions processed by the agency includes the following:

♦ $22.2 billion in disbursements for 8.8 million payroll payments

♦ 550,000 savings bonds

♦ 2 million contractor/vendor invoices, 675,000 travel claims

♦ 340,000 transportation bills

♦ 13,000 garnishments. When this project began, DFAS had non-standard and, in many cases, non-existent contingency plans The plans that did exist were obsolete, incomplete, and were maintained locally with no Agency-wide roll-up or distribution of information. In addition, DFAS did not have the necessary resources dedicated to the contingency planning effort, or to obtaining additional DFAS trained resources.

Before the LDRPS program, no funding was available for contingency planning**.** Also, most business process managers had no idea of the plans for their specific areas. Often, these same managers pointed elsewhere, generally in the direction of the IT community, whenever they were queries about the responsibility for their

plans. When a crisis, such as a hurricane, occurred staff scrambled chaotically trying to prepare and respond. For example, when a hurricane hit Charleston, South Carolina, in 1996, the Operations Location (OPLOC) had to go off site to seek backup files of their critical data processing and was not even sure where to find the backup.

DFAS contracted with EDS, in partnership with Logicon, to assist in developing a dynamic contingency planning program that would be standardized and could be implemented DFAS-wide. The plan needed to respond to an infinite number of disaster scenarios and have the capability to accommodate top-level roll-up and bottom-level planning. The plan also needed to be easily changeable and maintainable and had to be capable of providing quick response to emergency situations. Most importantly, the plan had to be usable by functional personnel to maintain their own plans. There was an initial review of available commercial off-the-shelf (COTS) software. Commercially available contingency planning software tools have been on the market for several years. However, sophisticated information systems, which are scalable and can support the planning needs of large and diverse organizations have only recently become available. DFAS evaluated COTS products based on numerous factors, including ease of use, comprehensive and dynamic planning capabilities, bottom-up planning capability with roll-up features for planning at various levels, design flexibility, information security, user control, technical support, and online help features.

DFAS also developed a user guide and training guide in order to establish the standards and protocols for using LDRPS to document DFAS contingency plans. In addition, DFAS developed a contingency planning workbook and testing guide. DFAS then issued policy delegating the responsibility for contingency planning to business managers and made contingency planning a responsibility of every DFAS employee. DFAS installed the COTS at five locations with remote access from 26 other DFAS locations worldwide. In addition , they provided training to the functional area users.

DFAS also developed security levels and user access to protect sensitive data and limit access.

As implemented by DFAS, LDRPS supports multiple simultaneous users and provides broad import and export capabilities from remote workstations and across network domains. It separates system administration duties from normal users and maintains security groups while providing multiple security levels. DFAS also established security levels for each menu item and developed detailed recovery files that provide before and after views of each transaction. DFAS uses extensive field masking and screen customizing capabilities that automatically link to the appropriate database tables. The system employs a COTS report writer (Crystal Reports), which accesses data in MS-SQL. DFAS also uses the system's data import and export capabilities to populate plans and to transfer data to other plans. DFAS uses the text capability of LDRPS to enter static planning information.

Currently, more than 1,700 static plans are in the LDRPS covering the various types of contingencies. for example, crisis management system activation and response, alternative processing, relocation locally and out of the geographic area, and reconstitution of core and core support business processes are all types of contingencies contained in LDRPS. In addition, LDRPS and associated contingency planning manuals and guides are included together with graphics such as maps and directions to assist with personnel relocation efforts. Information about employees, customers, service providers, assets, systems, telecommunications, and teams and tasks is also contained in the LDRPS database. Because the amount of stored data is immense, the LDRPS uses data warehousing to reduce data storage requirements and user workload. These text files, containing static plans combined with the dynamic data stored in the LDRPS database, enable DFAS to "construct" contingency plans "on-the-spot" to respond to the specific emergency situation. The end result of the effort is dynamic contingency plans that are based on Agency-wide standards developed and maintained at the lowest level of the Agency. These plans,

however, can be rolled up and are accessible at the highest level.

The COTS product, which was purchased in October 1996 and modified to satisfy DFAS-unique requirements, was implemented in January 1997. Production copies of the system were installed and implemented at the five large Centers within 6 months and completed DFAS-wide within 2 years. DFAS conducted a cost/benefit analysis before the project began. The total program costs for the LDRPS was $4.7 million—$500,000 less than planned. The start-up and implementation costs totaled approximately $2.4 million, which included the purchase of the software, software modification, and implementation. Operational costs are approximately $1.6 million a year. (*Note*: this is less than 0.1 percent of annual budget, which is well below the industry average of 2 to 5 percent.)

Most of the costs are for contract support and testing of mission-critical automated information system processing at a backup site. Before development of the LDRPS system, there were no current, viable contingency plans for continuity of operations; the existing plans were obsolete and incomplete. However, through the use of the automated LDRPS tool, more than 1,700 detailed contingency plans have been documented for all DFAS core and core support business processes and mission-critical systems. Consequently, contingency plans were developed and are now maintained at the local level by the business process managers and rolled up through the various levels of the organization to provide visibility and enable monitoring of the plans by DFAS management.

The contingency plans have already been used in a number of contingency situations, including recent problems with a transformer explosion at the Columbus Center; hurricanes, including Mitch, which required relocating some civilian pay functions from the DFAS Pensacola OPLOC to backup sites in Huntsville, Alabama, and Charleston, South Carolina; and flooding at the Rock Island OPLOC, which forced relocation locally. In addition to contingency situations affecting DFAS facilities, the information in the LDRPS is used for emergency

notification of personal points of contact if an employee becomes ill and for other administrative tasks, such as DFAS-wide telephone directory and locator service. The LDRPS also provided the information for contacting critical trading partners about Year 2000 (Y2K) compliance and contingency plans. In addition, the LDRPS provides a means to centrally distribute and control contingency planning information and to ensure immediate access to the LDRPS in time of emergency or communications problems. Each site maintains a copy of the LDRPS on a notebook PC that is located offsite.

DFAS-dedicated staffing has been reduced at some sites that had contingency plans and increased at other sites that did not have any plans at the beginning. In addition, most of the staffing is another duty as assigned, with all DFAS managers and employees having responsibility for their contingency plans. Overall, there has been a net decrease of seven dedicated staff DFAS-wide.

DFAS has assured the President's Special Y2K Council and the DoD that it has high confidence in the viability of the contingency plans now in place.

As the Agency has increased its reliance on automated information, the need for backup plans and the use of backup plans increases. For example, the Agency recently had to implement backup plans to pay almost 1 million civilian employees because of a problem with critical AT&T T-1 lines being cut during the critical processing window for transferring payment to the Federal Reserve Bank. With LDRPS, the agency successfully provided payment through alternative means and was successful in sending out notifications DoD-wide to employees, advising them of the problem and requesting them to check with their financial institutions before writing a check. This action forestalled an indeterminate number of inquiries to the civilian pay operations and prevented personal hardship for the employees.

With LDRPS, the information is available to enable development of contingency plans to respond to an emergency situation. Business managers are empowered to develop their own

plans, and they have a tool that assists them in complying with standards and policy requirements of the Agency contingency planning system.

For further information about the Living Disaster Recovery Planning System, contact Susan Nielsen, DFAS, at (703) 607-5155

National Emergency Management Information System

Agency: Federal Emergency Management Agency

The National Emergency Management Information System (NEMIS) is an enterprise-wide information technology system which allows the Federal Emergency Management Agency (FEMA) to better manage Presidential Disaster Declarations and the programs that provide assistance to the public and state and local governments following disasters, respond promptly and accurately to the public and Congress, and provide improved management controls and financial processes. NEMIS is the largest, most complex client/server information system ever built for managing natural disasters and one of the largest and most complex implementations of Oracle in a distributed client/server Windows NT environment. NEMIS, along with FEMA's switched telecommunications network, provides the foundation for FEMA's Information Technology Architecture.

During the period August through November 1998, FEMA received almost 400,000 applications for disaster relief as a result of Hurricane George and severe flooding in Texas. That figure was approximately 100,000 more applications than FEMA usually receives in an entire year. FEMA processed the bulk of the applications though its Automated Disaster Assistance Management System (ADAMS), FEMA's semi-automated legacy system which was built during the 1980s. ADAMS was able to manage the volume of work largely because it was spread among several disasters declared in various States, but FEMA was severely stretched. Facing the prospect of more and larger natural disasters,

FEMA had realized that ADAMS' outdated technology, limited automation support for some disaster programs, and lack of both system and program integration made it inadequate not only for multiple simultaneous major disasters, but also for a single catastrophic disaster. Moreover, ADAMS did not adequately support FEMA's newly reengineered business processes.

Consequently, FEMA began committing reinforcements to the battle in August 1998—the National Emergency Management Information System or NEMIS. NEMIS provides new processing capabilities that FEMA needs to manage multiple large disasters or a catastrophic disaster. In the 27 disasters the system has processed since then, NEMIS has proven its worth and demonstrated its potential to meet FEMA's disaster processing needs. The initial NEMIS capability and planned improvements fielded since August 1998 have prepared NEMIS to be capable of accomplishing what its aging predecessor could not—rapid, timely processing of disaster applications not for just one major disaster, but for multiple disasters when necessary. Under the leadership of Director James Lee Witt, FEMA has won great praise in recent years for changing the way it performs its disaster business. NEMIS has automated FEMA's reengineered business processes, making them standard across the Agency, integrating the programs and making them more efficient and effective. NEMIS is intra-Agency, inter-agency and inter-governmental in scope. It integrates and automates FEMA's Human Services, Infrastructure Support, and Mitigation disaster programs as well as FEMA's disaster declaration

and operations processes. It is used by the States and by the Small Business Administration (SBA) to implement related programs and to carry out State functions related to FEMA programs. NEMIS includes a capability to allow FEMA programs and the SBA to ensure compliance with the National Flood Insurance Reform Act. It has a Web-based reference library and other Web-based functions and a donations management capability that can also be used by States, standalone or in concert with FEMA. NEMIS incorporates document imaging and management capabilities that allow paper to be captured in digital form and provided to users at their desktops as part of case files, eliminating paper processing wherever possible. NEMIS is a fully automated on-line transaction processing (OLTP) system.

Before the advent of NEMIS, providing automated support to disaster assistance was very difficult. The disaster application system had evolved from the early 1980s and consisted of several modules that had been made to work together, but which were not integrated; they consisted of three vintages of technology. The modules included a DOS processing application, a pen-DOS inspection application and a Windows for Work Group registration program, running on a LAN-based server using an outdated database. The system was not scalable, had limits to the number of concurrent users, and had many manual and paper-based processes. It worked to a point, but it existed in approximately 40 different versions of software and required extensive manual processing using paper files. Furthermore, there was no connectivity between the three key components, Human Services, Infrastructure Support, and Mitigation; and the latter two programs had only minimal automation support. Business rules, critical for the processing of disaster claims from individuals, were hard-coded in differing versions of the software used throughout FEMA's 10 Regions, with each disaster providing some nuance for which the software would be altered. Congress—whose constituents were the disaster victims FEMA was charged with supporting—continued to exert pressure on FEMA for its lackluster performance in disaster relief. The Inspector General had criticized both the processes and the legacy

system. In short, FEMA's disaster information system was considered inadequate to manage a catastrophic disaster or multiple, simultaneous major disasters; a new system was needed.

FEMA's solution was the development of an enterprise-wide information system: The National Emergency Management Information System (NEMIS). NEMIS development began in late 1994 with a thorough business process reengineering (BPR). The BPR followed Raines Rules. Even though NEMIS was built in several versions or increments, FEMA decided to build each increment to be complete in itself. All of the disaster programs were included with sufficient functionality so that the new system could be used to process an entire disaster, while avoiding using both the new system and the legacy system concurrently in any single disaster. This ensured that the needed integration between programs and between parts of the system would be built-in upfront and that the system would contain all the data on a specific disaster, rather than it being partitioned across two systems. The segments or increments of development were based on the addition of capabilities to each of the program modules, rather than building a module at a time. The NEMIS enterprise development effort was led by FEMA's Information Technology Services (ITS) Directorate. Budget dollars for NEMIS were included in FEMA's ITS budget and a NEMIS Program Management Group (PMG), led by a senior engineer, was created to manage the development. The PMG then divided the system into modules and established a Task Force (TF) for each module to define requirements, design the system through a spiral design approach, test each release, monitor progress, and resolve issues related to NEMIS' development and ultimate fielding. TFs included employees from FEMA program offices, regions, States, other Federal agencies, and a member of the PMG. The modules are as follows:

♦ Emergency Coordination

♦ Human Services

♦ Infrastructure Support

♦ Mitigation

- ◆ Emergency Support (financial, human resources, and so on)

- ◆ NEMIS-wide (architecture, database, COTS standards, and so on)

NEMIS development was conducted as an enterprise development with emphasis on developing an integrated hardware and database architecture, the use of common programming languages and tools, a common set of standards and conventions and integration between the modules where necessary. This enterprise approach was in contrast to previous "program-centric" approaches in FEMA, for which each FEMA office or program would develop its own system with any integration or interfaces to the Agency networks or other programs handled ad hoc or not at all.

Absolutely key to the effort's success were the TFs and a NEMIS Steering Group, led by the Deputy Associate Director of IT Services and Deputy CIO, FEMA. The Steering Group consisted of Deputy Associate Directors (who in several cases are the first level below the political level at FEMA) from the program offices plus the Deputy Chief Financial Officer, the Senior Acquisition Official, and representatives from the Office of the Inspector General. The Steering Group ensured support for the program, provided policy direction, set priorities for development, assisted in overcoming a variety of issues, and contributed significantly to successful implementation.

From the technology perspective, FEMA's PMG chose best-of-breed products for the NEMIS infrastructure. Anteon Corporation, the prime contractor for NEMIS, designed a system that runs the Windows NT operating system on high performance Compaq servers using the Oracle 8 relational database. The software applications were built in Sybase's PowerBuilder, and Mosaix ViewStar manages workflow. NEMIS also incorporates Microsoft Office into its applications. For system management, NEMIS uses Microsoft System Management Server for software distribution and for auditing the inventory of hardware and software throughout the enterprise from the NEMIS Operations Center. BMC Software's Patrol and its Knowledge Modules are used to monitor the Oracle database, ViewStar

workflow processes, and PowerBuilder applications. NEMIS also uses PowerServ's Padlock to control access to the PowerBuilder objects. FEMA's in-house developers built the NEMIS Access Control System (NACS), an enterprise-wide system responsible for managing a complex set of access controls. The access controls are based on organizational positions to which NEMIS roles and permissions are assigned. These access controls, in concert with extensive management controls built into each module, provide a robust set of management controls intended to satisfy issues raised by the Inspector General about the lack of adequate management controls in the predecessor system, ADAMS.

Using numerous COTS packages, a best-of-breed solution was developed in a cooperative effort among FEMA in-house developers and its prime and sub-contractors. The use of NT, Oracle, and ViewStar support a distributed architecture that allows NEMIS to serve Headquarters and Regional Offices, fixed disaster processing centers, and disaster field offices, which are created ad hoc at the time of a disaster. NEMIS is a robust system, and additional features are added as the technology advances. Because NEMIS performs a wide range of financial functions and is electronically interfaced with FEMA's financial system, it is considered a financial system. The performance of financial functions and the interface with FEMA's financial processing system ensure more rapid and accurate payment of benefits to disaster victims and will reduce processing costs. NEMIS also includes document imaging and management capabilities in several modules. For Human Services, NEMIS supports a centralized mailroom where all applicants send supporting documents that are then imaged, indexed to their cases, and made available electronically to processing staff and helpline operators who can provide status information to applicants who call a toll-free number at any time. The applicant assistance processing and the helpline are virtual capabilities and can be performed at any location within the NEMIS enterprise.

During the period 1994 to 1996, following the BPR, FEMA moved forward with legacy work and concept development. The NEMIS project was approved and funded in April 1996. By

September 1996, FEMA had defined its requirements and by August 1998 had fielded its first version. Since August 1998, FEMA has fielded three Version 1 Maintenance Releases and fielded Version 2 in June 1999 and expects to release Version 2 Maintenance Release 1 in September 1999. FEMA expects NEMIS to be fielded within the $70 million budget allocated for the period FY96-FY01. The budgeted amount would take NEMIS through Version 2.0, Maintenance Release 1 (September 1999). However, FEMA intends to request an additional $2 million in FY00 for needed additional functionality. The total requirement could run to approximately $75 million or less than 10 percent over budget. One notable aspect of NEMIS is that, although it required 2 years to field Version 1.0 compared to the 1 year originally planned, most of the NEMIS functionality intended to be fielded in four versions over 5 years will actually be fielded 1 year earlier than planned. After fielding, it is estimated that NEMIS will require approximately $8.4 million a year for operations and maintenance (O&M).

There are numerous creative aspects to NEMIS that exemplify best IT practices. First, it is an extremely complex, enterprise-wide system, which is designed to serve all varieties of disaster cases. Its Human Services automated business rules will handle 90 percent of the individual applicant cases, and the coding of these rules required "creative" thinking and close collaboration on the part of FEMA's contractors, in-house development staff, and program office users. NACS, developed in-house, is an enterprise-wide, complex access control system that rectifies shortcomings articulated in a previous Inspector General's (IG's) report about the legacy system. NEMIS incorporates a complex implementation of NT servers, Oracle, Oracle Replication schema, PowerBuilder applications, ViewStar workflow processes, document imaging capabilities, Web-based tools, and remote control servers (which allow rapid update of data files by FEMA disaster assistance personnel from hotel rooms on site). NEMIS is impressive for its complexity and the number of products integrated, as well as the scope of the application and the sheer size of the enterprise—NEMIS production databases contain more than

16,000 tables, 313,000 columns, and 14,000 database triggers. NEMIS is also an example of best IT practices in the development approach it followed. Beginning with an enterprise system as a goal, FEMA brought together developers, program managers, and users to define the business case, follow Raines Rules, undertake a spiral design and development approach, and build and field the system incrementally. FEMA also established a test and development lab that engaged hundreds of FEMA users in extensive testing of NEMIS, from initial Alpha and Beta testing, through acceptance and final operational testing. This exhaustive testing regimen prevented major software problems when NEMIS was fielded. Following this effort, FEMA and its developers could literally fix the problems that occurred "on the fly" in the field. NEMIS, along with FEMA's switched network, provides the foundation for FEMA's Information Technology Architecture. Part of the plan for NEMIS, when the disaster system was fielded, was to have other Agency applications built on the NEMIS backbone. FEMA has acquired and fielded an enterprise facilities management application, and has fielded the Rapid Response Information System, an on-line Web database of Federal Government assets, to respond to weapons of mass destruction. Both use the NEMIS backbone. FEMA's non-disaster mitigation programs, including Project Impact, FEMA's highest priority program activity, also use the NEMIS platform. This aspect of NEMIS is part of the "build it once and use it often" approach that was part of the initial business case presented to the Director.

Although it is difficult to compare before and after costs, because FEMA cannot define the costs of the legacy system, all of the metrics used to measure NEMIS' success are positive. It has been fielded within the budget of approximately $70 million, and it will be completed very close to the original budget. System deployment was originally planned to occur in four major versions over 5 years. It has now occurred in two major versions and several maintenance releases over 4 years. Customer satisfaction with changes in FEMA, including NEMIS, is very positive, as noted by the decrease in complaints from members of Congress and the favorable comments from system users and FEMA's customers. The

SBA and the States also like the new system and the direct interface they now have with FEMA. The resultant decreased processing time for claims has also been well received. With the advent of NEMIS, FEMA has fielded an enterprise-wide system that possesses the capabilities of handling not only a major disaster, but also many disasters simultaneously. NEMIS' enterprise-wide aspect has also served to eliminate the multiple versions of software in the 10 Regions and has resulted in a standardized way of conducting FEMA's disaster programs. The importance to FEMA employees and State employees of being able to use the same system cannot be overestimated. It is still too early in the use of NEMIS to see the reduction in operating costs that FEMA expects to achieve. The auto-determination in Human Services, faster processing, automated financial interface, and improved processes in Infrastructure Support and Mitigation should all result in reduced operating costs when the FEMA staff is fully trained and experienced with NEMIS. FEMA expects a positive return on its NEMIS investment within 7 years or less, although the primary purpose of the NEMIS development was to ensure the capability to perform the mission, not to reduce costs.

NEMIS works because the people at FEMA wanted it to work. Not only that, but they had a stake in its success. FEMA's commitment, from the Director through the program offices, the Steering Group, and the CIO, to the PMG, the NEMIS TFs, and the employees resulted in the fielding of an enterprise-wide system, which will provide rapid assistance to disaster victims throughout the United States. NEMIS streamlines a process which was previously outdated, cumbersome and, from the perspective of its customers, non-responsive. It incorporates best-of-breed technology and exemplifies the results that can be achieved when Government and industry "partner" to solve problems.

Additional information about NEMIS may be obtained from Dennis DeWalt, at (202) 646-3318.

NEMIS is a FEMA-wide system of hardware, software, telecommunications and applications which provides a new technology base to FEMA and its partners for carrying out the emergency management mission.

The various players, both within and outside FEMA, who will be able to coordinate their emergency management activities.

Paperless Career Field Designation

Agency: Office of the Director of Information Systems for Command, Control, Communications and Computers (DISC4), Strategic and Advanced Computing Center, Department of the Army

The paperless Career Field Designation (CFD) process—the first initiative of an Army-wide intranet system, the Army Knowledge On-line (AKO)—gives officers quick access to accurate information to make an informed career field selection. This is just the beginning. Building on the success of the CFD process, DISC4 and the U.S. Army Personnel Command (PERSCOM) will continue to expand AKO capabilities to empower soldiers and develop them for the challenges of the 21st century.

**"The Career Field Designation Web site is earning its spurs as a powerful tool for OPMS XXI. If you have not already done so, I encourage you to investigate
this tool."**
*Dennis J. Reimer, General, United States Army,
former Chief of Staff*

The Army's mission is to fight and win the nation's wars. But readiness today does not necessarily translate into readiness tomorrow. With the end of the Cold War and the explosion of information technology (IT), the Army Deputy Chief of Staff for Personnel (DCSPER) knew it was time to review a series of specific issues pertaining to the Office of Personnel Management

System (OPMS). This is not the first time OPMS has been reviewed. Twice before—in 1971 and 1984—Army task forces studied OPMS and made recommendations for change, and the Army has experienced significant changes since the 1984 OPMS study. The most significant events affecting Army personnel requirements include the drawdown of the Army at the end of the Cold War and changes resulting from three major legislative initiatives—the Goldwater-Nichols Department of Defense Reorganization Act of 1986, the Defense Acquisition Workforce Improvement Act, and Title XI legislation for Active Component Support to the Army National Guard and Army Reserve. The drawdown resulted in a major reduction in Army personnel staff at all levels while the legislative mandates and the needs of the National Military Strategy required a realignment of officers' skills and career fields that exceeded the supply available.

In May 1996, the DCSPER recommended to General Reimer, the Chief of Staff of the Army (CSA) at that time, that the Army initiate an OPMS Study—OPMS XXI—to determine the best strategy in addressing these demands on Army officer personnel. The CSA convened the OPMS XXI Task Force in July 1996. General Reimer instructed the Task Force to review and

update the current OPMS to ensure that the system continues to develop officers to meet the challenges of a changing world—officers who can fight and win today's wars and the wars of an uncertain future.

Thirty-five officers representing the Army's various branches and functional areas served as members of the Task Force, applying their individual and collective expertise and leadership

Historically,

Officer Personnel Management Knowledge Center
- **An E-Commerce-type process that allows officers to communicate easily with PERSCOM.**
- **Allows for paperless transactions.**
- **Provides up-to-the-minute career information.**
- **Expansion: Electronically enable and reengineer additional career processes.**

Staff Officer's Knowledge Tool
- **Web-based staffing / workflow tool.**
- **Allows staff officers to easily find and use organizational knowledge.**
- **Provides latest organizational charts, Subject Matter Expert registry, threaded discussion groups.**
- **Expansion: Electronically enable and reengineer additional business / work processes**

The Future

- **Expand Personnel Knowledge Center user base.**
- **Export Knowledge Tool to additional staff offices.**
- **Launch additional AKO projects.**
- **Reengineer processes for the Army intranet**
- **Evolve enterprise-wide architecture.**
- **Tie-in to existing knowledge sites.**

Figure 4 *OPMS XXI addresses the changing needs of the institutional Army as well as the sophistication of it soldiers.*

experience to the study. To achieve the CSA's objectives, the Task Force developed an officer management system based on career fields. Officers will now compete for promotion with other officers in the same career field. This process will end the practice of "double counting" during promotion boards, for which selected officers count against promotion floors for both

their branch and their functional area. Each career field has its own distinct developmental track for officers, reflecting the readiness requirements of the Army today and into the 21st century.

How will it work? As officers approach selection for promotion to major, they will submit career-field preference statements indicating where they would like to compete for the rest of their careers after being selected for major—against other branch officers or officers who hold a similar functional area. The designation process would consider, among other things: the officer's preference, manner of performance, and rater input from the new Officer Evaluation Review (OER) in addition to the Army's needs. A board of officers, separate from the majors' promotion board, would make recommendations about where officers could best serve the Army.

PERSCOM accomplished all personnel actions manually through large mailings to

- Common User Toolbar
- Completely Browser-Based
- Important Career Announcements
- 128 Bit Security
- Career Points of Contact
- Career Information
- Electronic Career Forms
- Calendar / FAQ
- Threaded Discussion Areas
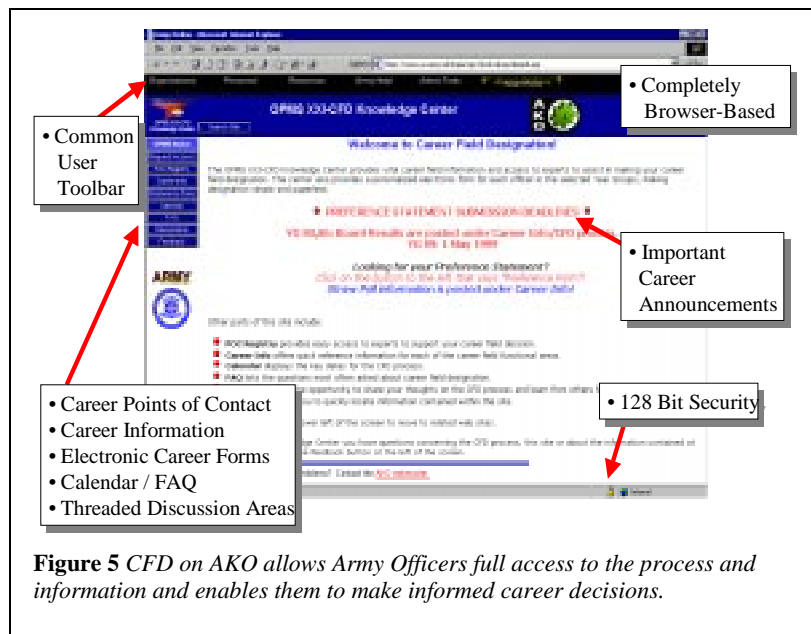
Figure 5 *CFD on AKO allows Army Officers full access to the process and information and enables them to make informed career decisions.*

individuals. When officers received their paperwork, they filled it out and mailed it in; that ended the officer's involvement. The process left many officers dissatisfied with the career choices they received, and made the PERSCOM process a mystery to those affected. In addition, PERSCOM spent a majority of its time on administrative activities, rather than in counseling Army officers.

The solution was to transform the traditional one-way process into an interactive one by using an on-line, knowledge-based, paperless method for Army officers to designate their career field preferences. This solution supported PERSCOM by reducing the administrative burden of personnel action mailings and the handling of paper forms. It supported Army officers by taking the mystery out of the process and provided them with information that allows them to make informed decisions about their own careers. In addition, it gives PERSCOM insight into areas where the officer corps lacks information, which helps PERSCOM to tailor its briefings and team trips to better meet Army needs.

In March 1998, the Strategic and Advanced Computing Center began working with PERSCOM to implement the paperless CFD on AKO, the secure Army intranet. The implementation strategy was to use an existing infrastructure by hosting the system on AKO. The Web-based solution was designed to allow Army officers continuous, up-to-date career information; access to their records; and e-mail. The paperless CFD process caused a paradigm shift in the way that officers communicated with PERSCOM. What was once a one-way process was transformed into a two-way communication. Now officers can see the results of their CFD submissions in near real-time. In addition,

PERSCOM can now provide the most current, up-to-date information to the field quickly and easily, allowing for easy incorporation of late-breaking guidance or changes. The successes of this first effort resulted in PERSCOM requesting that additional OPMS XXI personnel processes be enabled via AKO.

A significant number of officers (18 percent) who had not been counseled personally about the paperless CFD process used the information on the AKO site as their sole criterion for selecting a career field. Seventy nine percent of officers considered that sufficient information was provided on the site for them to make an informed career field decision. The site decreased the traditional time for receiving input from the field from 6 months to 3 months. Eighty eight percent of all officers in the field elected to use the OPMS XXI site to submit an electronic CFD rather than mail one; 95 percent of these officers indicated high levels of satisfaction with the electronic version. Within the first 4 weeks of the site going active, 50 percent of officers submitted a CFD electronically. This compared favorably with the traditional paper-based Functional Area Designation preference process return rate, which had required approximately 3 months for the same 50-percent submission rate.

This change in the business process enables PERSCOM action officers to devote more time to

Officer Quotes:

"Great system and an inspiring way to communicate."

"The form is easy to use and should speed up selection."

"This is a well-organized site and I appreciate the effort that has gone into it and this entire process."

"This site is quite good. Keep up the good work and keep the site updated."

Survey Feedback:

"Sufficient information is available to assist me in making an informed career preference decision"   **79% Agree**

"The Preference Statement was easy to use"   **95% Agree**

» **Over 50% Submission Rate After Only Four Weeks**

   » **Over 90% of Submissions via Website**

Figure 6 *Customer satisfaction with the on-line process has been overwhelming, leading the way to future AKO personnel initiatives.*

career field advice and counseling and less to administrative requirements. Furthermore, PERSCOM had required an average of 15 minutes to resolve errors on paper-based CFD forms. Because the electronic form catches errors automatically and requires officers to correct them prior to submission, PERSCOM eliminated errors from 376 forms (calculated using their standard 8 percent average error rate on submitted paper forms).

Future functional development will support all Army officers with career field information, a standardized e-mail address that they can use throughout their careers, and access to an increasing number of paperless forms for communicating with PERSCOM. Other OPMS XXI initiatives that will soon be available on AKO are the paperless Functional Area Designation at an officer's 5-year point, the Battalion and Brigade Command paperless Command Preference Designation, and the Senior Military Schooling paperless Senior Service College Preference Statement. Ultimately, the OPMS AKO partnership will allow all officers to submit a paperless assignment preference and to access their on-line Officer Records Brief (ORB).

The Army sees this as a creative solution, because it causes a dramatic change in the way that officers and PERSCOM communicate—shifting communication from a one-way channel to a collaborative, open environment. An officer can now communicate with PERSCOM on line throughout the process. Officers can access the information they need from any workstation, whether it is from the officer's personal computer at home or one at work. It takes the mystery out of the process by publicizing the progress and analysis of CFD submissions so that an officer can see which career fields are in high demand. This access permits officers to change their career designations, based on the most current information, all the way to the closing date. By providing up-to-the-minute career information, CFD puts the officer in control of his career by giving him the tools necessary to make an informed career decision.. It leverages current infrastructure (AKO) and leading-edge technology to create a knowledge-based, collaborative, interactive solution to a long-standing manual process.

The goal has always been to create a "win-win" system for both the Army and its officer corps, balancing the Army's diverse personnel requirements while providing Army XXI with a technically and tactically competent officer corps—leaders who can create learning organizations focused on excellence in all they do. One thing is certain: The officer development system will be a flexible system—one best suited for the officer corps, the Army, and the nation.

Additional information about Paperless Career Field Designation, may be obtained by contacting MAJ Charlie Wells at (703) 614-6907.

PLETHORA

Agency: National Security Agency

An automated system and a highly engineered, sophisticated process that empowers a workforce to review and redact millions of digitized classified documents line by line.

Executive Order 12958, dated April 17, 1995, mandates that every Federal agency review all classified holdings after 25 years for possible declassification. It further stipulates that unreviewed records are subject to automatic declassification. At the time the order was issued, the National Security Agency (NSA) was holding more than 10 million pages of 25-year-old classified documents that would be automatically declassified by April 2000. This huge collection of classified material consisted mostly of paper documents—some in good condition, some in poor condition—and a significant amount of microfiche and microfilm. Given NSA's vast holdings, the Executive Order presented a tremendous challenge. The schedule was very short, Intelligence Community policies have not been fully formulated, there were no adequate facilities, and there were very few precedents on which to build.

Before Executive Order 12958, NSA's classified documents were subject to release after 50 years. Since very few of NSA's holdings were as old as that, the declassification effort was quite limited. A small staff was sufficient to photocopy and declassify all documents by redacting sensitive passages with felt markers.

With the advent of the Executive Order, everything changed. The new requirements, dwarfing previous requirements, resulted in an exponential growth in the volume of classified material to be processed, which was certain to overwhelm the existing manual procedures. To meet the demands of wholesale declassification of millions of pages, NSA decided to automate the process under project PLETHORA. The vision was to use an automated system that would empower a workforce to review and redact digitized documents line by line.

The Government PLETHORA team determined that an imaging system was needed to scan up to 50,000 pages a day, capture the images, perform image clean-up and optical character recognition, and allow for manual indexing. The documents would then be routed to 50 subject matter experts seated at workstations who would review and redact the documents. The system would have to provide for ready retrieval of both the original and the declassified versions of each document. Declassified documents would be transmitted to storage media through a firewall to ensure that sensitive information stored in the system would not be inadvertently commingled with the declassified material.

The Solution

After surveying the imaging and redacting solutions offered by a number of vendors, NSA and its PLETHORA contractor, AlliedSignal, chose to work with VITGroup, a system integrator in Reston, Virginia. VITGroup proposed a system based on its HighView software package. This solution was attractive because the COTS product provides an array of functionality that was directly

applicable to NSA's declassification problem, so that only a moderate amount of tailoring was necessary. This was especially important to NSA because of the short timeframe prescribed by the Executive Order. A qualified work force of retired NSA personnel was assembled and workstations were acquired.

NSA and the system developers settled on an incremental delivery approach, and it was decided that an existing laboratory would be refurbished to accommodate the 100-seat system. VITGroup delivered a limited operating capability that included document preparation, scanning, and indexing as promised in October 1997, just 4 months after contract award. The automated declassification system, the staff, and the facilities were all ready when needed, and productive work began immediately. A more robust product was delivered some 4 months later, incorporating all the additional functionality needed to declassify documents. Since delivery of the initial operating capability, NSA has scanned more than 2 million pages and redacted more than 1.6 million pages. Accommodating the project's arduous schedule and the complexity of the workflow, the system has fulfilled NSA's highest expectations, with plans for further improvement.

Keys to Success

NSA attributes the success of the PLETHORA project to a number of factors:

♦ Use of a tailored commercial product versus development of a new software application

♦ Dedicated effort by the system developer

♦ Application of open system standards

♦ Formulation of a project management office dedicated to the effort

♦ Adherence to a disciplined development and testing approach

♦ An incremental development methodology

♦ Involvement of system users during the requirements formulation, implementation, and test phases

♦ Good communications between the project management office, the users, and NSA management

♦ Strong management support

♦ A system engineering/technical assistance contractor experienced in optical imaging

The Future

NSA is progressing with plans to improve and enhance the automated declassification system. One major initiative under way is the addition of software to facilitate exchange of classified records among Federal agencies and departments. Because classified material can be declassified only by the organization authorized to classify it in the first place, it is often necessary to send the material to another Government organization for review and redaction. The new software will make it possible to provide documents to other organizations on magnetic media or online, and it will track the status of each document.

In another significant upgrade, the automated declassification system will be extended to allow NSA's Freedom of Information Act (FOIA) and Privacy Act staffs to take advantage of the system's imaging, storage, retrieval, and redaction capabilities. NSA is also exploring various algorithms to locate duplicate documents, pages, and passages among NSA's holdings. This formidable problem is being attacked incrementally. Thus far, NSA has installed an infrastructure that will allow various algorithms to be installed as they are developed.

PLETHORA's Legacy

Predating the severe time and volume constraints imposed by the Executive Order, work under the old manual system proceeded at an uneven, often stop-and-go pace. The enormity of the task of declassifying 10 million pages within a 5-year period demanded an automated solution. NSA's response was to integrate leading-edge technology with a highly engineered, sophisticated process. Initial costs under PLETHORA's automatic declassification processing were calculated at $5.05 a page. With the system operating at sleek efficiency and the process well established, costs have been reduced to 93 cents a page, and future plans incorporating a new scanner with larger page size imaging and an algorithm to enhance optical character recognition (OCR) capability will realistically slash costs to 50 cents a page.

Based on results to date, NSA is now confident of meeting the once-daunting deadline imposed by Executive Order 12958. Considering the enormity of the task and the rigorous schedule, this was indeed a momentous accomplishment. Had it not been for the PLETHORA project, several hundred reviewers would have been needed to achieve the same goal, at a cost far greater than that associated with the automated declassification system. Furthermore, a number of concomitant benefits, such as ready retrieval of documents, application to the FOIA and the Privacy Act, and duplicate detection, would never have been realized. An ancillary benefit is that historians and the general public will have access to a great number of formerly classified records, thus broadening the impact and extending the benefits of the PLETHORA project far beyond the Agency.

Additional information about the PLETHORA project may be obtained from James Smith at (301) 688-2115.

Procurement Gateway

Agency: Defense Logistics Agency

A Web-based procurement system that distributes more than 10,000 solicitations a month to the vendor community. This system yields significant cost savings and decreased procurement times for just-in-time logistics to support the warfighter.

The Defense Logistics Agency (DLA) supports our nation's warfighters by providing supplies and services to America's military forces worldwide. The DLA's mission includes managing more than 4 million consumable items, processing more than 30 million annual distribution actions, and administering more than $900 billion of DoD and other agency contracts. As explained on the DLA Web site, "If our forces fight with it, wear it, eat it, burn it as fuel, or otherwise use it, the DLA probably provides it, arranges for its reutilization after the consumer no longer needs it, or has managed the contract to obtain it." With such a significant role in the success of the nation's warfighting machine, the DLA places great importance on its ability to procure items quickly and efficiently.

Historically, the DLA's procurement process involved four contract shops distributing more than 30,000 solicitations a month to the vendor community. Yet the system was not optimal for promoting competition among vendors; typically, only three vendors would respond to a solicitation. Finding solicitation information was not easy, nor was the process of bidding on an opportunity. In addition, vendor costs for purchasing relevant

RFQ documents, such as copies of engineering drawings, resulted in a limited number of vendors responding to DLA solicitations.

At the same time, the DLA sought to move its procurement process to a paperless model. More than $3 million was spent each year on printing and mailing solicitations, processing quotes, and mailing award documents at just the largest center, the Defense Industrial Supply Center (DISC), in Philadelphia.

With the growing use of Web technologies, the DLA recognized an opportunity to streamline its procurement process. Out of this recognition came the DLA Procurement Gateway, a Web-based procurement information system that supports the contracting community; the vendor community; and ultimately, the warfighter.

The DLA Procurement Gateway (http://progate.daps.mil/home), debuted in late 1996 after limited success with posting solicitation information on electronic bulletin boards. At the start, the DLA knew the costs of developing the Gateway would be less than the costs of printing and mailing solicitations alone. To help develop cost/benefits metrics, the Agency used a return on investment (ROI) study for paperless contracting. For solicitations alone, the DLA spent $497,000 a year (for paper and mailing costs) for the DISC center in Philadelphia. In addition, the Agency spent $952,000 a year for paper production, mailing, and distribution of award documents; $375,000 for processing quotes; and more than $1.26 million for drawing

distribution and mailing—all at just the Philadelphia center.

When determining who would develop the system, the DLA considered the Defense Automated Printing Service (DAPS). The DLA and the DAPS were independent agencies at the time (DAPS now falls under the DLA umbrella), yet a close working relationship was already in place through the DLA's contracting with DAPS for printing services. The partnership was a natural solution, given DAPS' strength in electronic document management.

What resulted was a system that accepts and stores basic contract documents (RFPs, RFQs, and Contract Awards) in electronic form using a 'lights out' digital-to-digital process that converts these documents from their proprietary format to the common Portable Document Format (PDF). Vendors can search an RFQ section by keyword, national stock number, federal stock class, buyer code and date range. Vendors can also submit a profile, which allows the Gateway present solicitation information based on the profile given. This not only ensures that more vendors are made aware of relevant solicitation information, it also helps to filter out the responses that are not compliant with the solicitation.

On the Gateway home page, users can access specifications and drawings through JEDMICS and the DoD Specification and Standards ASSIST Program, an interface to DoD systems containing these documents. The system also features an electronic bid room and affords vendors the capability to submit bids online. After each closing date, the DLA evaluates the bids and notifies the successful bidders by e-mail. Through the Gateway, vendors will soon be able to submit invoices electronically via a link to the bill-paying function with the Defense Finance and Accounting System (DFAS).

In just its first year of operation, the DLA Procurement Gateway achieved a remarkable ROI of 3: 1 (investment to cost-savings). The costs to implement the DLA Procurement Gateway were offset by the cost savings from printing, distributing, and mailing procurement documents. The initial outlay for equipment was less than $100,000. The DLA worked with contractor

Universal Systems, Inc., to develop the initial prototype software for $56,000. A further $100,000 and $200,000 was spent on hardware upgrades.

The DLA also took advantage of two systems that had been developed previously: the Automated Bidset Interface (ABI) system, which had been created 2 years ago to serve up drawings on the Web, and the ASSIST system, which was developed by the DAPS to convert paper to electronic documents for specifications and standards.

When it proved to be successful, the DLA wanted to expand the Gateway to the entire Agency, and set aside $360,000 to develop an Internet Quoting System, which included the purchase of two hardware servers. As the system came together, the JECPO office considered the system to be best-of-breed and set aside an additional $250,000 to present a single face to industry.

In the end, the DLA invested a little more than $1 million in the Gateway. The Agency expects to pay $700,000 annually for sustainment costs—largely for added functionality and hardware and software upgrades—and to the DAPS for electronic document conversion. Two future enhancements that are to be implemented soon include the Internet Quoting System and the marriage of the Gateway to DFAS' Web Invoicing System (WInS). This latter function will electronically populate invoices with the correct data and allow vendors to submit completed invoices to DFAS with a simple mouse click. Finally, the system will also feature shipping notice information that informs the DLA when contracted supplies are due to arrive. This last feature has particular relevance in the DLA's ability to provide prompt support down to the foxhole.

The actual cost benefits of the system are significant: more than $3 million in savings for *the DISC organization alone* from the elimination of paper production, mailing, and distribution costs. The DLA Center in Philadelphia has since made it policy that it will no longer send out paper for solicitations. The Richmond and Columbus DLA Centers have yet to become completely paperless and are using the Gateway to a more limited extent.

Beyond the cost savings, other metrics point to the early success of the DLA Gateway. At any given time, the Gateway has 38,000 solicitations on line versus just 40 percent of that number when the DLA used electronic bulletin boards. Soon after its debut, the site had 30 vendors registered with profiles; currently, more than 3,000 vendors have created profiles. In May 1998, 3,000 unique PCs were hitting the system; 1 year later, the number had skyrocketed to 76,000. The site averages 2.1 million hits a month. The challenge now is to strengthen the system hardware to manage the Web traffic capacity.

For vendors, the benefits are numerous. Previously, vendors had to pay for engineering drawings and services that gathered paper data for them under the Freedom of Information Act; now, the data are free and accessible to all in electronic format on the Web. In addition, the procurement cycle has been reduced from 21 days to as little as 5 days without the added mailing time. Moreover, because the system pushes more information out to more vendors, some solicitations have received as many as 35 bids—a significant increase on the previous average of 3.

The DLA Procurement Gateway makes the best use of Web technology to extend procurement data as part of the DLA's core mission. The system represents a partnership success story of Government agencies—the DLA and the DAPS—and industry. The Gateway can also be easily replicated by other Government agencies.

Overall, the benefits brought by the DLA Procurement Gateway are evident in customer satisfaction and ROI. By every measurement, this system has yielded win/win results for all involved: for the Government, which saved costs and increased competition; for the vendors, who also saved costs and now have access to better information; and for the warfighter, who is ensured a smoother, more definitive supply chain.

Additional information about the DLA Procurement Gateway may be obtained from Ralph Colavita, Program Manager, at (215) 737-9213 or rcolavita@dscp.dla.mil.

Strategic War Planning System and Enterprise Database

Agency: U.S. Air Force/U.S. Strategic Command

The U.S. Air Force used a creative development process and strong program management to implement a major planning system 3 years ahead of schedule

In 1994, the U.S. Strategic Command (USSTRATCOM) had a major problem: numerous disparate information technology (IT) planning systems, residing in a primarily mainframe processing environment, had to be integrated to support the U.S. Air Force's (USAF's) new strategic planning needs. With the end of the Cold War and the need to react to different kinds of threats and vulnerabilities, it was necessary for the DoD to collect and analyze data differently. USSTRATCOM had the needed information contained in multiple National Planning systems that supported major USAF forces, but the data was dispersed among multiple systems and databases. The systems and various databases had to be integrated to allow fast access to current data.

To integrate the National Planning Systems, USSTRATCOM had to address some systems shortcoming. For example, 35 systems and 23 databases containing a total of 18,000 data elements had to be integrated without affecting the processing environment that was current in 1994. This large volume of systems and data meant that the integration process had to be carefully planned and managed.

Data integration also had to be carried out with care. Data was spread over redundant databases and duplicate data elements were prevalent. Because databases were populated at different intervals, data integrity issues also had to be addressed. A good enterprise view of data and how it was being used had to be understood before data could be successfully integrated.

In addition, the National Planning Systems could not easily support planning the timelines required by the DoD in the post-Cold War era. New features, such as the ability to quickly perform Crisis Planning, meant that data had to be accessed and processed much faster than was possible with the processing environment capabilities existing at that time. Also, data had to be accessed from other DoD systems, with which the National Planning Systems did not interface or have any kind of electronic exchange capability. Many of the current systems had to be extensively modified or redesigned to support new capabilities and interfaces.

Finally, belt tightening throughout the Federal Government meant that USSTRATCOM had to upgrade their systems, incorporate new functionality, and build new electronic interfaces within an environment of reduced budgetary resources. Limited resources had to be used to successfully integrate the systems and the data contained in the systems. The maintenance costs of supporting multiple systems and multiple databases had to be reduced.

To address these issues, USSTRATCOM fully analyzed its current environment and decided to totally redesign and consolidate the Strategic War

Planning System (SWPS) into a new, robust open systems client/server environment. In addition, they had to reduce the number of disparate databases and the 18,000 data elements that populated these databases. Because this was a major undertaking in itself, the Enterprise Database (EDB) was added to the SWPS name, creating the initiative title: Strategic War Planning System (SWPS) and Enterprise Database (EDB). Their challenge was to quickly redesign and consolidate the systems and data without impacting the legacy-processing environment while at the same time providing the needed new capabilities.

To successfully meet this challenge, USSTRATCOM employed an innovative 3-pronged strategy. First, they created and implemented a unique, highly advanced systems development process. The process was based on an advanced systems development methodology called the Spiral Development methodology, which allows an organization to incrementally build a new system in small phases where a system is built a little, tested, built a little more, tested, and so on. Each phase of the system is used as a basis for the next phase of the system, allowing for new functionality to be continually added. USSTRATCOM adopted this methodology to their development process and identified three development "spirals," whereby each spiral implemented new functionality that was used as a basis for the next spiral. This process allowed USSTRATCOM to quickly develop SWPS and EDB and incorporate new requirements as they were being identified. The process also enabled the SWPS and EDB client/server environment to be developed and fully fielded 3 years ahead of schedule.

Second, Integrated Project Teams (IPTs) were formed, which consisted of systems development personnel and SWPS users. The teams were responsible for focusing on customer and functional/business processes, identifying

functional process improvements, and performing business process reengineering. These teams completely redesigned the existing strategic planning process, integrating many independent processes. The redesign helped streamline the planning process and at the same time identified new system capabilities.

Third, IPTs were leveraged to consolidate the number of databases and data elements. IPTs were used to create an enterprise data model. These teams examined how the existing systems used data, identified duplications, and developed new processes that streamlined how data was distributed. Through the work of these teams, 23 databases were consolidated into one database model and 18,000 data elements were reduced to 2,200 data elements.

By implementing this strategy, the SWPS and EDB client/server architecture was implemented in 1998—3 years ahead of schedule. The legacy system that existed in 1994 was completely replaced. The original 35 systems were consolidated into 7 new systems, reducing the original 20 million lines of code to 12 million. The SWPS and EDB now interfaces with other DoD systems, allowing planners full access to needed information.

Since its implementation in 1998, the SWPS and EDB has realized significant cost savings and provided numerous benefits to its customers. Operational costs have been reduced by 20 percent, which includes personnel reductions of 26 percent. In addition, operational planning timelines have been significantly reduced and new capabilities are now available to assist USAF strategic planners. The SWPS and EDB is an ongoing operational system with an established record of sustained successful operation.

Additional information about the SWPS and EDB may be obtained from LtCol Brian Kelley at (402) 294-8752.

Suspense Tracking System and Document Database

Agency: Office of the Under Secretary of Defense for Policy

STS/ODD combines an automated workflow system to track internal and external policy suspenses and an electronic document management system to coordinate response documents and serve as a central repository. It streamlines work processes for key Policy business activities and provides greater management oversight and visibility.

The Office of the Under Secretary of Defense for Policy (OUSD(P)) was encumbered by a variety of processes and methods for tracking many concurrent action items. It was also hampered by manual processing and distribution of works in progress. These existing processes resulted in lower productivity and tardy actions, which, consequently, affected the timeliness and quality of policy analysis and recommendations.

OUSD(P) seized the initiative in 1995 and 1996 to evaluate its business processes and to identify and implement opportunities for improvement. The results of this comprehensive assessment of the organization were documented in the OUSD(P) Business Plan (Version 3), dated September 1996. Included in the Business Plan were improvements that Policy could make to enhance information flow and overall productivity. Two initiatives included the tracking of Policy actions and electronic access to relevant documents.

Identified needs included the following:

♦ Single, uniform, and consistent methods to track internal and external Policy suspenses

– Reducing the number of tardy and adjusted suspenses

– Providing enterprise-wide visibility to the status of suspenses

♦ Electronic access to relevant documents, that is, a central repository of key references relating to a particular subject for senior leadership and Action Officers (AOs)

♦ Improved intra-Policy collaboration and coordination

♦ Reduction of manual processes and the need for AOs to hand carry correspondence for coordination

♦ More time for development of coordinated, national security policy recommendations and less time spent on the administrative aspects of processing correspondence.

The solution was to develop an automated workflow and electronic document management system—the Suspense Tracking System (STS) and OUSD(P) Document Database (ODD). The STS is a database used to track suspenses within Policy. The ODD is a database used to electronically coordinate and staff response documents and as a document repository of completed actions. The two databases are linked. The ODD provides the ability to easily retrieve electronic documents. The STS provides the ability to track suspenses and provides management oversight to all Policy suspense. The

suspense actions in the STS can be electronically linked to the response documents in the ODD. Both databases are full-text searchable and can be Web-enabled for read only. In the latest release, there is automated workflow, e-mail notification of taskers as they are assigned, and e-mail reminders of actions coming due and overdue. Technologies used include database management system/electronic document management, object linking and embedding, workflow, full text search and retrieval, and Web-enabled access. Lotus Notes is the principal platform.

There were some impediments to implementation. First of all, the original requirements were top-down driven; consequently, there was a lack of full user buy-in. There were few users trained in automation and an unwillingness of some users to let go of their individual, manual systems and proprietary ways of doing business that led to duplication of effort. Secondly, there was no standard configuration of the desktop at the time of initial deployment and users lacked the necessary hardware and software platforms to handle the memory-intensive Notes applications without slowing or freezing the workstations. Lastly, there were multiple mail systems that limited the ability to use the full power of Notes as a GroupWare application.

To solve these problems, the Policy Automation Directorate (PAD) upgraded the hardware to Intel Pentium PCs and high-speed Macintosh PCs and the software to a standard desktop configuration. They also migrated to a single, e-mail solution, Lotus Notes. To facilitate user acceptance, OUSD(P) increased Notes training efforts, offering numerous classes and providing a Lotus Notes User's Training Guide. OUSD(P) also sponsored two forums, the Overarching Integrated Product Team (OIPT) and the Working Integrated Product Team (WIPT), with membership from senior leaders and users within Policy. Each of these forums was designed to help gain user feedback and acceptance. They also put together an ODD Process Action Team.

Because of the nature of Policy's output or products, which are national security policy recommendations and ideas, performance is somewhat difficult to measure. Due in part to the frequent turnover of military personnel, there was

no documented "As-Is" baseline for comparison. Key factors in the project's success include the following:

♦ Senior leadership gave it the necessary priority needed and resources to make it happen

♦ The databases streamlined and automated key business processes and provided policy members and senior leaders with easy visibility to all suspenses, including the high-priority taskers coming from the Secretary of Defense's and Deputy Secretary of Defense's Offices.

Lessons learned include the following:

♦ Develop a formal functional requirements document with activity and data models before beginning any software development

♦ Obtain user involvement and commitment early on and carry out an active public relations/marketing effort throughout the organization regarding upcoming initiatives and how they will improve the users' working environment. Advertising can be done via user forums, newsletters, Web sites, personal sessions, and so on.

♦ Incorporate applicable changes in business rules to avoid duplication of effort by having both a manual and electronic process in place

♦ Establish an expanded change management program that focuses on the needs and attitudes of the user community

♦ Slow down the rapid prototyping and allow more time for beta testing and training before roll-out

♦ Establish a separate development, test, and operational server

♦ Establish performance measurement targets, baselines, indicators, and criteria

This "best IT practice" is a successful application of workflow and document management predicated on reengineered business processes. It organized and streamlined suspense tracking and document management in an organization where "papers" and "ideas" (relating to national security policy formulation) are the outputs of its business. By automating these key business processes, senior leaders, AOs, and other Policy personnel

have more time to research and coordinate their decision papers and recommendations, thereby leading to a more informed, well-defined DoD position.

No formal cost or benefit analysis was conducted for this project. However, it was obvious from the beginning that an automated suspense tracking system and a key documents management system would reduce manpower, as well as the amount of paper and other supplies required to produce multiple copies for distribution of a tasking moving up or down the chain. It was clear it would also save labor hours for AOs walking an action through the staffing process. Although it is difficult to place a price on a national security position, the reduced administrative time permits more research and coordination time, thereby leading to a more informed and well-defined DoD position. Total program costs (start up and operational costs to date) are $644,000. Start-up/implementation costs were $256,000. Operational costs are $170,000 a year.

Benefits include improved productivity, fewer late suspenses, increased participation in response preparation, reduced staff costs, and elimination of manual logging and tracking activities. Specific before and after comparisons include:

♦ Operating Costs: $300,000 / $170,000

♦ Staffing: 12 / 10

♦ Manual logging of 300 Freedom of Information Act (FOIA), Mandatory Declassification Review (MDR), and Security Review cases was eliminated completely

♦ Elimination of approximately 75 telephone calls a day to the various action offices to determine status, because the STS and ODD systems provide this information. These systems also reduced the amount of time required to respond to queries about cases.

♦ Hard copy taskers via manual distribution versus instantaneous electronic notification of taskers

♦ Phone calls to action offices to obtain status versus instantaneous checking via log history

♦ Manual logs of FOIA, MDR, and security review cases versus on line tracking and status of cases

♦ Key documents immediately available electronically within the ODD versus having to proceed to the controlling office to obtain a paper copy

♦ Fewer late suspenses; time savings of automatic e-mail notification; time savings of elimination of manual hand off of tasker document once scanners are in place; time savings in tracking down status of suspenses; time savings of manually locating and retrieving copies of response documents/decision papers

♦ Greater consideration of viewpoints; better staffing, and coordination of packages

In terms of Return-on-Investment (ROI), it is difficult to place a dollar value on a better national security decision. Because of the nature of OUSD(P)'s output—national security policy recommendations and ideas—labor is the only area in which to see an increase in efficiency or a decrease in costs as a result of the implementation. AOs may now be able to produce documents of higher quality as a result of having Lotus Notes, CHAIRS, and the Intranet at their desktop. Document quality, while extremely important in our business, is not easily related to costs. These IT initiatives have made it easier for Policy to assume significant new workloads with no increases in staff.

Additional information about STS/ODD may be obtained from Lothar Harris at (703) 692-8105.

Web Invoicing System

Agency: Defense Finance and Accounting Service

A Web-based technology, which enables the Defense Finance and Accounting Service (DFAS) to implement Electronic Data Interchange (EDI) technology to reach out to its entire vendor community, regardless of contractor size and, with minimal cost to the vendor, to realize cost savings, reduce contractor overhead dollars, reduce public voucher, commercial invoice, and progress payment requests. Provides an economical means for low volume vendors to participate in Web-based electronic invoicing, eliminating the need for expensive EDI software and communications services.

The implementation of EDI among Government agencies and their commercial vendors is progressing well throughout the Department of Defense (DoD), due in part to innovative uses of Web technology. Significant savings continue to be realized as EDI transactions are processed throughout DoD business areas, including acquisition (requests for quotes, contracts, and mods) and finance and accounting (invoices and receiving reports).

DFAS is responsible for implementing EDI across its finance and accounting systems. DFAS Headquarters' Electronic Commerce Office is responsible for managing its EDI implementations. DFAS goals for EDI include: i) reengineering the vendor and contract pay business areas into streamlined, standardized, paperless processes; ii) reducing errors in DFAS

payment systems by eliminating manual data entry; and iii) reducing DFAS data entry and entitlement processing labor hours. One of the areas in which DFAS found EDI to be a major challenge is invoice processing. DFAS supports more than 300,000 contractors of various sizes with an annual volume of more than 16 million invoices, vouchers, and progress payment requests. Though EDI has helped to reduce costs, the common use of EDI for invoicing has been limited to larger firms having the financial and personnel resources necessary to implement EDI. DFAS' mid- to small-size contractors cited hard-to-understand EDI formats and rules, the lengthy system configuration process to getting started, and the high implementation and sustainment costs as reasons for not embracing electronic commerce. DFAS soon realized that to achieve total electronic invoicing, an alternative method for submitting invoices electronically had to be implemented.

DFAS-developed Web Invoicing System (WInS) enables current paper-based vendors to send invoices electronically via Web-based technology. Three vendors support DFAS WInS project: Tecolote Research, Inc., Concurrent Technologies Corporation, and Sterling Commerce. DFAS has created a win-win solution for both the Government and the contractor, regardless of size. Transparent to the contractor, WInS application creates an EDI transaction for submission to DFAS payment systems. WInS also takes advantage of existing EDI submission architecture

through the Defense Information Services Agency (DISA) communications architecture already in place in support of EDI submissions through the value-added network (VAN) process. A WInS-created EDI invoice is forwarded to the designated DFAS payment system and posted automatically, eliminating DFAS manual entry associated with paper-based invoices, thus reducing DFAS cost per invoice. WInS does not require the vendor to use translation software or VAN services. Translation to the EDI ANSI X12 transaction sets is accomplished on WInS' server. The WInS system provides an easy-to-use method for collecting and securely transferring invoice data from the vendor's PC to DFAS payment systems. WInS resides on a Government Web server with vendors obtaining a user-ID and password after the Government has verified that the vendor has an active contract for that payment system. Vendors simply fill in invoice information on pre-formatted screens and submit data for processing. Edits and validations occur before the file is translated to ANSI X12 invoice formats and forwarded through the DoD information processing infrastructure to the payment systems. An invoice log allows the vendor to review, edit, and print invoices for transmission tracking and to meet their Federal Acquisition Regulation (FAR) data administration requirements.

DFAS implemented the first phase of WInS on May 15, 1998. The first phase supported Internet invoicing for the Mechanization of Contract Administration System (MOCAS) public vouchers and commercial invoices. On December 14, 1998, WInS was expanded to include Internet invoicing capability for our Standard Automated Material Management System (SAMMS) commercial invoice contractors and on January 5, 1999, batch file submission capability was added for MOCAS public vouchers. Batch submission eliminates manual entry into WInS screens for vendors with large volume, but provides the same rigorous edit checking and the view/edit/print capabilities found in the manually entered WInS screens. In April 1999, WInS added progress payment capability for MOCAS and expanded batch to include MOCAS commercial invoices. SAMMS commercial invoice batch was added in June 1999. Additional DFAS payment systems

will be added during the remainder of 1999. As of August 8, 1999, WInS had 1,439 MOCAS and 697 SAMMS account requests; more than 64,000 invoices or vouchers with a total value of $4.2 billion have been processed since WInS went operational in mid-1998.

The total program cost for WInS from FY98 through FY00 was $1.09 million. During this same period DFAS realized a return-on-investment of $2.51 million. WInS also reduced the Invoice/Voucher payment cycle time as shown in the Table below (mail/processing):

	Before	After
Progress Payments	14 days	4 - 7 days
Public Vouchers	19 days	1 - 7 days
Invoices	35 days	30 days

There are several creative aspects to WInS. It is provided to vendors at no cost, other than their annual Internet Service Provider connection; therefore, it dramatically increases vendor electronic invoicing participation. A full set of performance measures were developed to measure the cost savings associated with reduction of contractor overhead dollars (paper savings and labor savings related to preparation of paper and tracking of lost invoices), and invoice/voucher/progress pay processing times. WInS is low cost/burden for contractors to implement and use. With Internet access and a username and password, vendors are able to access WInS. User-friendly screens with on-line edit checks improve quality of data, and invoice-tracking mechanisms allow vendors to easily follow their invoice from submission through receipt at the payment system. DFAS actively markets WInS capability to the vendor community. DFAS incurred minimal costs to implement and maintain WInS. Close cooperation between DFAS, Defense Contract Audit Agency (DCAA), and Defense Contract Management Command (DCMC) has enabled DFAS to successfully re-engineer their vendor/contract pay business processes. This has led to reduced cost of financial services to the customer base: the Services and DoD agencies.

The first phase of the WInS application was developed for DFAS under Defense Logistics

Agency (DLA)-sponsored EDI funding, by the Federally funded Johnstown, Pennsylvania, Electronic Commerce Resource Centers/Technology Development Activity (TDA). This joint effort allowed DFAS to prototype WInS without heavy DFAS initial software development costs. The use of new and emerging electronic commerce technologies and commercial off-the-self (COTS) products provide easy-to-use, cost-effective information systems and applications that benefit both the Federal Government and its trading partner base. As required, custom programming interfaces were developed to fill the technology gaps among the COTS products, information processing technologies, and business applications.

DFAS has demonstrated customer satisfaction by the rapid adoption of WInS within the DoD contractor community, with emphasis on mid- and small-sized contractors. More than 1,000 vendors actively use WInS, with more than 200 new registrants a month since WInS went live—a consistent 20 percent a month growth rate. Currently, more than 12,000 invoices are submitted monthly, growing by an additional 2,000 a month. DFAS has documented several vendor/contractor testimonials that stress their observed reduction in payment time, the elimination of lost invoices and a reduction in rejection rates for invoices/vouchers /progress payments submitted. DFAS continues to implement additional payment systems: STARS in September 1999, and IAPS and CAPS to come in the fourth quarter of 1999.

For additional information regarding WInS, contact Ms. Diana Buttrey, diana.buttrey@dfas.mil.

Industry Advisory Council

Industry Volunteers

NAME	COMPANY	POSITION
Michael F. Kush	EDS	Task Force Chair; FEMA; State; JCS
W. Deane Stanley, III	Vector Research	Senior Advisor
Cori Asaka	Troy Systems	Team Lead; Army
Pat Bennis	LEADS Corp.	Team Lead; OSD; DISA
Sandy Boyd	COMSO, Inc.	Team Lead; NSA
Robert Deller	Markess International	Team Lead; AF; DFAS
Catherine Martin	BMC Software	Team Lead; DFAS
Glenn Morris	Open Text Corp.	Team Lead; Navy
Chris Oneto	BITS, Inc.	Team Lead; AF
Tricia Reneau	Inacom	Team Lead; DLA
Chuck Viator	Protegrity, Inc.	Team Lead; NSA

CIT-PAD Additional Information

The Commercial Information Technology–Product Area Directorate (CIT-PAD) has distinguished itself by revolutionizing the way in which the U.S. Air Force procures Information Technology (IT) products and services and supports the products throughout their life cycle. A major component of the CIT-PAD's efforts to meet this mission is the Information Technology Tools (IT2) acquisition program, whose strategy provides a time-phased series of acquisitions in "Blocks" to fulfill Air Force IT requirements as existing contractual vehicles expire or new requirements evolve. This revolutionary strategy is projected to save the Air Force $70 million each year in personal computer expenditures alone, while also achieving information superiority and responsive combat support.

Their approach establishes a series of Supplier Market Categories (SMCs) and uses a time-phased process to have multiple vehicles in place to satisfy their customers' requirements. The SMCs are smaller, more manageable segments of IT products and services that mirror the commercial IT marketplace. This is in stark contrast to the old acquisition philosophy of "all or nothing" type requirements whereby the Government forced businesses to provide products and services outside their core competencies in order to be considered for a contract. The had proved to be a very unsuccessful strategy for participants.

The initial plan envisions 15 to 20 SMCs in three areas: Hardware, Software, and Services. Vehicles will be replaced in the SMCs every 2 to 3 years. Rather than running independent acquisitions, the CIT-PAD groups the SMCs according to need dates, conducts acquisition Blocks (based on the need dates) that result in contract vehicles being awarded for one or more SMCs, and uses other service/agency contractual vehicles when and where it makes good business sense to do so. This revolutionary, time-phased acquisition approach allows the CIT-PAD to do the following:

♦ Keep the acquisition team small

♦ Incorporate lessons learned into each block

♦ Get the best suppliers for each IT requirement

♦ Leverage volume to obtain good prices

The Program Management Office worked closely with the three prime contractors to implement Web-based ordering capability. Web-based ordering allows customers to build their own orders by placing selected products in a shopping cart scenario. When the shopping is completed the customer presses a button and places the order. It is much the same as everyone is accustomed to doing in everyday life from grocery shopping to car shopping. In addition to Web-based ordering, many other streamlined
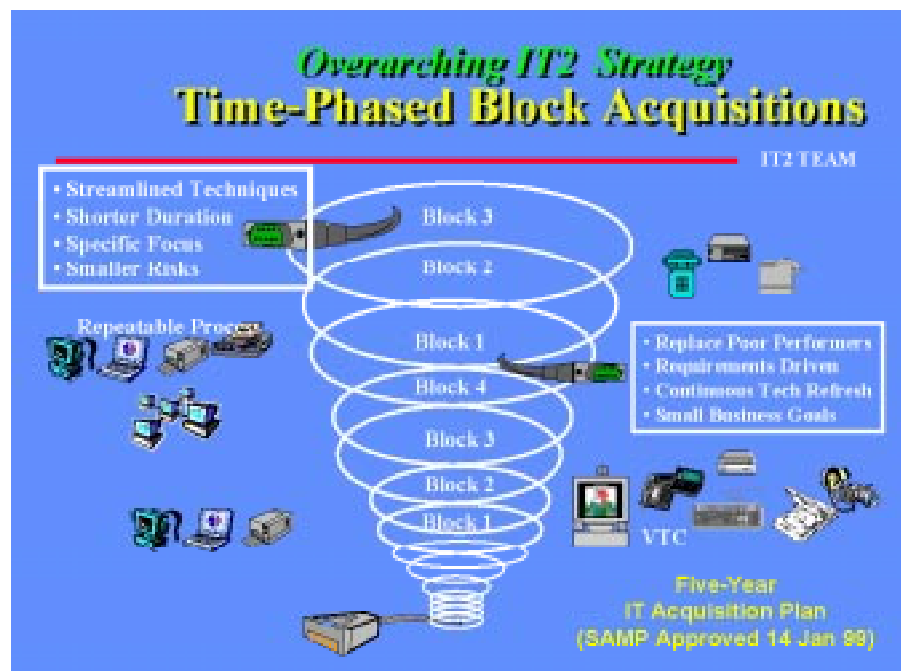
efforts have been put into place to ensure ease of use for customers. The fair opportunity statement is an automated process for each customer to ensure that the Government is getting maximum return on each dollar spent. By comparing all three prime contractors' product prices on the Web, customers can be assured of obtaining the best value purchase and have no problem in certifying that in the fair opportunity statement.
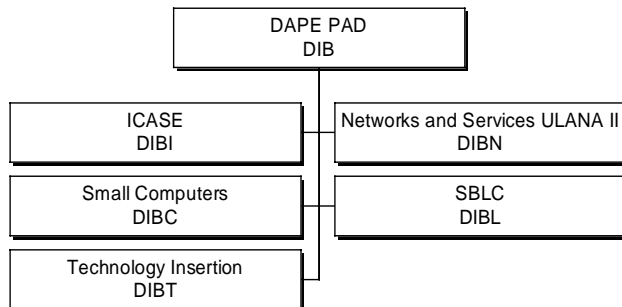
Goals/Objectives/Performance Indicators Matrix. The following table lists the four goals and resulting objectives and performance measures for the CIT-PAD. It is followed by an overview description of each Division.
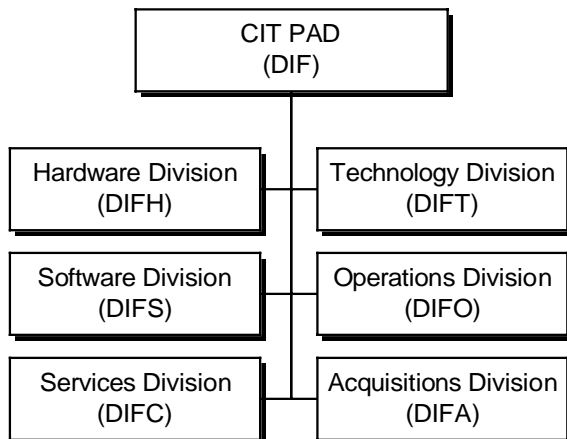
GOAL	OBJECTIVE	PERFORMANCE INDICATOR
1. **Obtain quality products and services at the best price available**	1.1 Leverage AF/DoD/Federal Agencies COTS buying power to obtain good prices	1.1.1 Requirements Collection / Marketing 1.1.2 Customer Satisfaction Assessment Reports (CSARs) 1.1.3 Contract Sales 1.1.4 Savings from Special Discounts or Consolidated Buys 1.1.5 Cost Performance relative to List/GSA/Other prices
	1.2 Obtain quality products	1.2.1 CSARs 1.2.2 Failure Rates
	1.3 Maintain currency of products available	1.3.1 Frequently, customer asks for something not available on existing contracts
2. **Run an effective and efficient operation**	2.1 Reduce COTS acquisition cycle times and costs	2.1.1 Cost and Time of Acquisitions 2.1.2 Number and Duration of Protests 2.1.3 Number of Wins/Losses
	2.2 Perform effective management of IT contract vehicles	2.2.1 Delivery / Warranty / Maintenance Times 2.2.2 Failure and Product Return Rates 2.2.3 Contract Modification Time 2.2.4 Contractor Performance Assessment Reports (CPAR) 2.2.5 Technology Refreshment Time/Frequency 2.2.6 Percent of Business w/out "touch labor"
	2.3 Manage the CIT-PAD revenue/expenses	2.3.1 Various Financial Reports
	2.4 Manage the CIT-PAD via the WWW	2.4.1 Mall Development Timeline 2.4.2 Number of Contracts in the Mall 2.4.3 Percent of Programs Managed via WWW 2.4.4 Network / Data Availability/Accessibility
	2.5 Anticipate trends in the IT Market	2.5.1 Technology Research Events/Timeline
3. **Provide customer-friendly contract vehicles satisfying Air Force IT rqmts**	3.1 Establish effective order processing capabilities and procedures	3.1.1 Order Processing Time 3.1.2 Order Modification Time 3.1.2 Order Error Rate 3.1.3 CSARs
	3.2 Build & maintain solid customer base *(Be the preferred provider)*	3.2.1 Number of Repeat Customers 3.2.2 Percent of Market Share 3.2.3 Number of customer complaints 3.2.4 Percentage of use by ESC organizations
	3.3 Reduce total cost of ownership for COTS IT products	3.3.1 Regular product comparisons of cost vs other vehicles
	3.4 Provide DII-COE and JTA-AF-compliant COTS products	3.4.1 Volume DII-COE & JTA-AF 3.4.2 Percentage of Y2K Products
	3.5 Conduct regular technology days	3.5.1 Number Conducted /Scheduled 3.5.2 CSARs
4. **Equip and train a professional workforce**	4.1 Equip, train, motivate, mentor, and develop our personnel	4.1.1 Number of schools/classes attended 4.1.2 Awards Submitted vs Won 4.1.4 Promotion Opportunities / Civilian Ratings (Percentage DIF-SSG-ESC-AF) 4.1.5 Number of people lost to industry (does not include PCS & retirement)

Prior Organization. The prior organization, Dynamic Assessment Planning and Execution Product Area Directorate (DAPE PAD) (HQ SSG/DIB) emphasized contract management.

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                    │    DAPE PAD     │
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   ┌──────────────────┐      │      ┌──────────────────────────────┐
   │      ICASE       │      │      │ Networks and Services ULANA II│
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   │  Small Computers │      │      │            SBLC               │
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Projected Organization. The following chart illustrates how the CIT-PAD (ESC/DIF) will be organized. This will emphasize "program" management.

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                    │    CIT PAD      │
                    │     (DIF)       │
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   ┌──────────────────┐      │      ┌──────────────────────────────┐
   │ Hardware Division│      │      │     Technology Division       │
   │     (DIFH)       │      │      │          (DIFT)               │
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   │ Software Division│      │      │     Operations Division       │
   │     (DIFS)       │      │      │          (DIFO)               │
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   ┌──────────────────┐      │      ┌──────────────────────────────┐
   │ Services Division│      │      │    Acquisitions Division      │
   │     (DIFC)       │      │      │          (DIFA)               │
   └──────────────────┘             └──────────────────────────────┘
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Objectives and Priorities

The following are all the ESC objectives and priorities that guide PAD's goals and objectives.

Objective 1 Meet our commitments to our customers for acquisition and operational support in war and peace.

Objective 2 Provide mentorship, professional development training, education, and health and wellness opportunities.

Objective 3 Recognize and reward excellence.

Objective 4 Develop and prove innovative concepts and new technologies to increase the effectiveness of air- and space-power.

Objective 5 Continuously improve and reengineer business processes and customer service to become more efficient, effective, and profitable.

Objective 6 Continuously improve facilities, infrastructure, and working and living environments.

Objective 7 Build the best pollution prevention, compliance, and restoration programs in the command.

Priority 1 Achieve an acquisition cycle of 18 months or less.

Priority 2 Integrate AF C2 using the Defense Information Infrastructure/Common Operating Environment (DII/COE) and U.S. Global Command and Control System/Global Combat Support System (GCCS/GCSS).

Priority 3 Reduce the cost of C2 system Acquisition.

Priority 4 Develop military unique capabilities in the critical C2 technologies.

Priority 5 Integrate Electronic Systems Center (ESC)/Support Integrated Weapons System Management (IWSM).

Priority 6 Be the development entry point for Air and Space Command and Control Agency (ASC2A)/Battlelabs.

Priority 7 Modernize ESC facilities, infrastructure, and management information systems.

Priority 8 Educate, train, and mentor our people, providing them world-class quality of support.

Acronyms

ABI	Automated Bidset Interface
ACOM	Atlantic Command
ADAMS	Automated Disaster Assistance Management System
ADM	Admiral
AEPS	Army Electronic Product Support
AFITC	Air Force Information Technology Conference
AFM	Army Flow Model
AKO	Army Knowledge On-Line and Computers
AO	Action Officer
ASC2A	Air and Space Command and Control Agency
BPR	Business Process Review
CAPS	Commercial Accounts Processing System
CFD	Career Field Designation
CINC	Commander-in-Chief
CIO	Chief Information Officer
CIT-PAD	Commercial Information Technology Product Area Directorate
CPAR	Contractor Performance Assessment Report
CSA	Chief of Staff of the Army
CSAR	Customer Satisfaction Assessment Report
DAPS	Defense Automated Printing Service
DCAA	Defense Contract Audit Agency
DCINC	Deputy Commander-in-Chief
DCMC	Defense Contract Management Command
DCSLOG	Deputy Chief of Staff for Logistics
DCSOPS	Deputy Chief of Staff for Operations
DCSPER	Deputy Chief of Staff for Personnel
DFAS	Defense Finance and Accounting System
DII COE	Defense Information Infrastructure Common Operating Environment
DISA	Defense Information Services Agency
DISC	Defense Industrial Supply Center
DISC4	Director of Information Systems for Command, Control, Communications, and Computers
DLSC	Defense Logistics Support Command
DoD	Department of Defense
EDB	Enterprise Data Base
EDI	Electronic Data Interchange
EPA	Environmental Protection Agency
ESC	Electronic Systems Center
EUCOM	European Command
FAR	Federal Acquisition Regulation
FEMA	Federal Emergency Management Agency
FOIA	Freedom of Information Act

GCCS/GCSS	U.S. Global Command and Control System/Global Combat Support System
GUI	Graphical User Interface
GPRA	Government Performance and Results Act
HQDA	Headquarters Department of the Army
IAC	Industry Advisory Council
IRS	Internal Revenue Service
IT	Information Technology
IT2	Information Technology Tools
ITMRA	Information Technology Management Reform Act
ITS	Information Technology Services
IWSM	Integrated Weapons System Management
JTA	Joint Technical Architecture
LDRPS	Living Disaster Recovery Planning System
LIDB	Logistics Integrated Data Base
MIS	Management Information System
MDR	Mandatory Declassification Review
MOCAS	Mechanization of Contract Administration System
NACS	NEMIS Access Control System
NEMIS	National Emergency Management Information System
NSA	National Security Agency
O&M	Operations and Maintenance
ODD	OUSD(P) Document Database
OER	Officer Evaluation Review
OIPT	Overarching Integrated Product Team
OLTP	On-Line Transaction Processing
OPLOC	Operations Location
OPMS	Office of Personnel Management System
ORB	Officer Records Brief
OUSD(P)	Office of the Under Secretary of Defense for Policy
PAD	Policy Automation Directorate
PCS	Permanent Change of Station
PDF	Portable Document Format
PERSCOM	U.S. Army Personnel Command
PMG	Program Management Group
POM	Program Objective Memorandum
PPBS	Planning, Programming, and Budgeting System
ROI	Return on Investment
SAMMS	Standard Automated Material Management System
SBA	Small Business Administration
SCTC	Small Computer Technical Conference
SMC	Supplier Market Categories

SPAWAR	Space and Naval Warfare Systems Command
STARS	Service Technology Alliance Resources
STS	Suspense Tracking System
SWPS	Strategic War Planning System
TAEDP	Total Army Equipment Distribution Plant
TDA	Technology Development Activity
TF	Task Force
USAF	U.S. Air Force
USMC	U.S. Marine Corps
VADM	Vice Admiral
VAN	Value Added Network
VCSA	Vice Chief of Staff of the Army
WInS	Web Invoicing System
WIPT	Working Integrated Product Team